SUMMARY OF OPERATIONS

California Oil Fields

THIRTY-SIXTH ANNUAL REPORT
OF THE
STATE OIL AND GAS SUPERVISOR
ISSUED BY
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS

Vol. 36 SAN FRANCISCO, CALIF., JANUARY-JUNE, 1950 No. 1

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EARL WARREN, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
WARREN T. HANNUM, DIRECTOR

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PREFACE

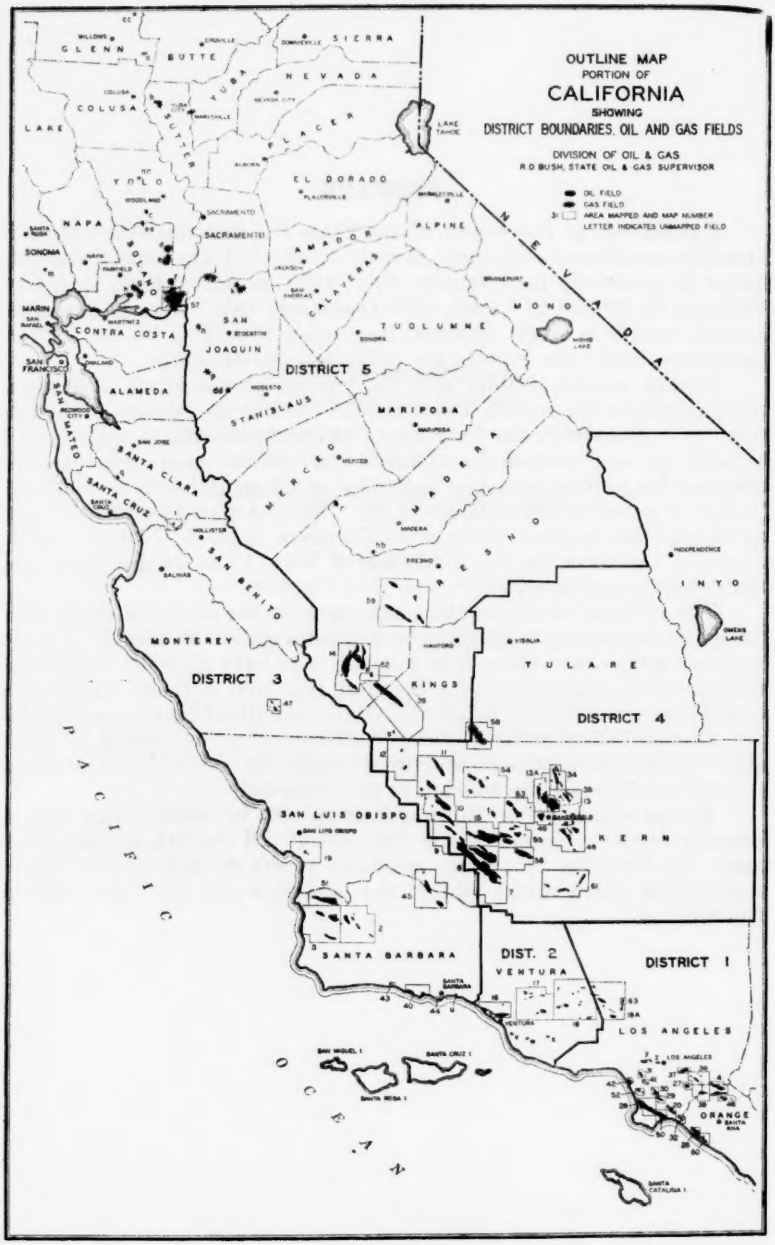
Publication of the report of the State Oil and Gas Supervisor in monthly installments commenced with April, 1919. The report was published in quarterly installments July, 1929, to June, 1939, inclusive. Volumes 25, 26 and 27 (July, 1939-December, 1941) were published as annual reports in single volumes. Beginning with Vol. 28, No. 1 (January-June, 1942) the reports are published semiannually.

Special articles dealing with the various phases of oil field operations appear in the report. These articles present the results of observations of engineers of the Division of Oil and Gas. Short articles of a suitable nature, written by operators or outside engineers, are also accepted for publication. A complete list of all special articles published to date is given in each number of the "Summary of Operations," and an alphabetical index of these articles is given in No. 12 (June) of Vols. 11 to 14, inclusive, in No. 4 of each of Vols. 15 to 24, inclusive, and thereafter in each issue.

The Division of Oil and Gas aims to serve the oil operators of California by furnishing them with the best information obtainable by statewide scientific observation. The purpose is to have all wells drilled and maintained in accordance with the most approved methods. The desired end can only be attained by careful study and attention to many details.

Branch Offices of the Division, maintained in the various oil fields, afford the oil operators an opportunity promptly and informally to avail themselves of the service which is at their disposal.

Errors appearing in this publication will be corrected as soon as brought to the attention of the Supervisor. All readers are invited to assist the Division by calling attention to errors and also by giving suggestions which might add to the usefulness of the "Summary of Operations."


OUTLINE MAP
PORTION OF
CALIFORNIA
SHOWING
DISTRICT BOUNDARIES, OIL AND GAS FIELDS
DIVISION OF OIL & GAS
R.D. BUSH, STATE OIL & GAS SUPERVISOR
OIL FIELD
GAS FIELD
AREA MAPPED AND MAP NUMBER
LETTER INDICATES UNMAPPED FIELD
DISTRICT 5
DISTRICT 3
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DIST. 2
DISTRICT 1
GLENN
BUTTE
SIERRA
NEVADA
COLUSA
LAKE
PLACER
EL DORADO
YOLO
NAPA
SONOMA
SACRAMENTO
AMADOR
ALPINE
MARIN
CONTRA COSTA
SAN JOAQUIN
TUOLUMNE
MONO
SAN FRANCISCO
ALAMEDA
STANISLAUS
MARIPOSA
SAN MATEO
SANTA CLARA
MERCED
MADERA
FRESNO
INYO
SANTA CRUZ
SAN BENITO
MONTEREY
KINGS
TULARE
KERN
SAN LUIS OBISPO
SANTA BARBARA
VENTURA
LOS ANGELES
ORANGE
PACIFIC
OCEAN

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19	Arroyo Grande	
18	Bardsdale	
11	N. Belridge	
10	S. Belridge	
	Beverly Hills	y
12	Blackwells Corner	
	Bowerbank (gas)	t
4	Brea-Olinda	
8	Buena Vista Hills	
54	Buttonwillow (gas)	
	Cache Slough (gas)	f
55	Canal	
55	Canfield Ranch	
43	Capitan	
3	Casmalia	
2	Cat Canyon	
	Chowchilla (gas)	r
14	Coalinga	
55	Coles Levee	
	Conejo	x
4	E. Coyote	
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10	Cymric	
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15	Elk Hills	
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40	Elwood	
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20	Long Beach	
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	Maine Prairie (gas)	e
	Marysville Buttes (gas)	b
10	McDonald Anticline	
44	Mesa	
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	W. Montalvo	v
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59	Raisin City	
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53	Rio Bravo	
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18	Simi	
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55	Strand	
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7	Sunset	
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10	Temblor	
55	Ten Section	
	Thornton (gas)	j
28	Torrance	
	Tracy (gas)	p
58	Trico (gas)	
38	Turnbull	
16	Ventura	
	Vernalis (gas)	dd
54	Wasco	
39	West Coyote	
	West Montalvo	v
60	West Newport	
61	Wheeler Ridge	
38	Whittier	
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2	Zaca	

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No maps published for fields located by letters.

HELM OIL FIELD

By R. G. FRAME[a]

INTRODUCTION

The Helm oil field is located in the western half of the San Joaquin Valley, about 22 miles southwest of Fresno, Fresno County, and lies within T. 16 S., and T. 17 S., R. 17 E., and R. 18 E., M. D. B. & M. It is a long narrow field, extending in a northwest-southeast direction nearly 11½ miles, and is slightly over three-fourths of a mile wide. The town of Helm lies two miles north of the northwest end of the field. The productive limits of the field are rather definitely established. The maximum development comprised an area of approximately 4525 acres, which has now (July 1, 1950) been reduced through abandonments to about 4140 acres.

In a field of this size in California, it is very unusual to find only three companies owning all of the producing wells. These companies are: Amerada Petroleum Corporation, General Petroleum Corporation, and Pacific Western Oil Corporation. For several years, The Superior Oil Company had two productive edge wells, but both are now abandoned.

The Helm oil field is the only field in the State, other than the Coalinga field, in which commercial production of oil is secured from Cretaceous sands.

The sole literature on the Helm field published to date, to the writer's knowledge, is a short article in the "Estimate of Natural Gas Reserves of the State of California" January 1, 1946, prepared and published by the Public Utilities Commission in conjunction with the Division of Oil and Gas. The writer wishes to acknowledge free use of the data in the article referred to above. He is also indebted for many helpful suggestions to Mr. C. L. Doyle, District Engineer for General Petroleum Corporation, and Mr. C. D. Graves and Mr. H. Hill, Superintendent and Engineer respectively for Amerada Petroleum Corporation.

The following illustrations accompany this report:

Plate I—Contour map showing contours on top of the Domengine.
Plate II—Cross section A-A along the apex of the anticline.
Plate III—Cross section B-B at right angles to strike of the anticline.
Plate IV—Electric log and Stratigraphic Section.

HISTORY OF DEVELOPMENT

The Helm oil field was discovered in 1941 by Amerada Petroleum Corporation. The discovery well, "Clover" 31-34 (now "Helm Unit" 31-34) Sec. 34, T. 16 S., R. 17 E., was drilled to a depth of 10,257 feet. A formation test of an Eocene sand (Domengine) in the interval 7940 to 7970 feet recovered a strong gas blow estimated at 10,000 Mcf. per day. There were no oil or gas showings below 8053 feet, so 5½-inch casing was cemented at that point. Three intervals were gun perforated and tested. The first interval tested, 7990 to 8005 feet, was of Paleocene age and

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during a one-hour test, the well flowed at the rate of 96 barrels of 60-degree gravity oil and 2950 Mcf. of gas per day. The second test was of a Miocene sand in the interval 7448 to 7465 feet, and for one and one-half hours the well flowed at the rate of 27 barrels of 65.7-degree gravity oil and 9576 Mcf. of gas per day. The third interval tested was another Miocene sand from 7300 to 7310 feet. The well was completed in this interval on October 9, 1941, and flowed at the daily rate of 242 barrels of 64.0-degree gravity oil and 3845 Mcf. of gas. The production remained clean until January 1943, when the well began to make water and sand. The perforations were then cemented off and the well recompleted in the lower Miocene sand from 7445 to 7465 feet.

The second well drilled was Amerada Petroleum Corporation well No. "Weyant" 5-27 (now "Helm Unit" 5-27) in Sec. 27. It was completed on February 14, 1942, flowing 254 barrels of 30.9-degree gravity oil per day with a gas-oil ratio of only 567 cubic feet per barrel. This well demonstrated the existence of dark oil in the new field. The production came from the Paleocene interval 8100 to 8110 feet, subsequently named the Weyant sand.

The first deep commercial production of Cretaceous oil in California was from Amerada Petroleum Corporation well No. "Wheatville Ranche Co." F 21-8 (now "Helm Unit" F 21-8), Sec. 8, T. 17 S., R. 13 E. The Cretaceous sand, from 7992 to 8122 feet, was unusually thick, but only the top 40 feet was oil sand. Five and one-half inch casing was cemented at 8050 feet, and after a successful water shut-off test at 7917 feet, the casing was gun-perforated from 8000 to 8015 feet for production. On May 23, 1943, the well flowed at the rate of 137 barrels of 56.4-degree gravity oil cutting 3.4 percent and 2366 Mcf. of gas per day. (The only other oil recovered from the Cretaceous formation in California is in the Oil City area of the Coalinga field, where a minor amount comes from shallow wells). The operator, however, did not choose to produce the Cretaceous (later named the Wheatville sand) and the well was plugged back and completed on June 11, 1943, in the Miocene interval from 6630 to 6655 feet. The initial production was 492 barrels per day of 33.5-degree gravity oil cutting 0.1 percent with a gas-oil ratio of only 443 cubic feet per barrel.

On October 9, 1942, General Petroleum Corporation abandoned its well "Noble" 88-9, Sec. 9, T. 17 S., R. 18 E. at a depth of 8508 feet without obtaining production. For a while it seemed that this location marked the southeasterly limit of the field. Seven months later, however, The Superior Oil Company completed "Kreyenhagen" 81-22, Sec. 22, T. 17 S., R. 18 E., about one and one-half miles southeast of "Noble" 88-9 in the Lanare area. This well flowed 107 barrels per day of 39.6-degree gravity oil cutting 0.2 percent, from seven feet of oil sand in the Miocene interval 6848 to 6855 feet. Subsequent development has proved practically all the acreage between the Lanare area and the main portion of the field and also extended the productive limits two and one-third miles farther southeasterly.

On December 31, 1945, a unit plan for the development of the sands below 7750 feet went into effect. This interval includes all of the productive zones below the Temblor sands. Only three oil companies are involved in the unit plan, namely: Amerada Petroleum Corporation, General Petroleum Corporation, and Standard Oil Company of California. The two

latter companies have only relatively small acreage in the unit. The large holdings of W. H. Noble & Co., leased by General Petroleum Corporation, because of the landowner's unwillingness to participate, are not included in the unit plan.

The approximate northwest two-thirds of the field, including all of the structurally high gas cap portion, was marked off for unitization and Amerada Petroleum Corporation selected as the unit operator.

On April 1, 1946, General Petroleum Corporation put into operation a natural gasoline absorption plant, which handles all of the gas from both the Helm and Riverdale oil fields. The plant is located near Burrel and is about one and three-quarters miles northeast of the Helm field.

Nearly all the active drilling in the Helm field occurred during the war years from 1942 to 1945 and through 1946. On June 30, 1950, 75 wells were producing, 21 shut-in, and 35 abandoned. Of the abandoned wells, 16 were dry holes and 19 were abandoned because of noneconomic production.

GEOLOGY AND STRATIGRAPHY

Structurally, the Helm oil field is a long narrow asymmetrical anticline plunging slightly to the southeast with at least six normal faults cutting across the axis (Plate II).

Sufficient data are not available to accurately determine the hade of the various faults, but all appear to hade northwesterly at various angles as shown on Plate II. This section also shows that apparently two periods of faulting occurred; one after the Kreyenhagen shale was deposited and pre-McLure, and one post-McLure.

The vertical displacement at the top of the Domengine in the different faults varies from 50 to 100 feet. The displacement of the formations becomes progressively less from the Domengine upward to the top of the McLure, illustrating the gradual relief of gravity stresses away from the focal points.

Definite unconformity exists at the base of the Domengine, and probably at the base of the Paleocene. Plate III shows truncation of the Paleocene beds under the Domengine. In the Cretaceous strata below the Paleocene a similar condition is thought to exist, but as only a few wells penetrated the Cretaceous to any appreciable extent, definite proof is still lacking.

The anticlinal structure of the field is only faintly reflected in the Temblor and McLure beds (Plate III).

The formations encountered in the Helm field range in age from recent valley alluvium to Cretaceous. Since the operators had no interest in the non-oil-bearing formations above the Temblor, no coring was done and no attempt made to classify the Pleistocene, Pliocene and Upper Miocene formations.

The ages of the strata encountered from the surface down are:

Recent alluvium
Pleistocene
Pliocene
Santa Margarita (Upper Miocene)
McLure (Upper Miocene)
Temblor (Middle Miocene)
Kreyenhagen (Oligocene and Upper Eocene)

MAP OF
HELM OIL FIELD
FRESNO COUNTY, CALIFORNIA
SHOWING
CONTOURS ON TOP OF DOMENGINE

ACCOMPANYING REPORT BY R. G. FRAME

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

SCALE

3000 0 3000 6000 FT.

JULY 1950.

LEGEND

- Uncompleted drilling
- Uncompleted idle
- Uncompleted abandoned
- Completed producing
- Completed idle
- Completed abandoned
- Water
- Abandoned converted to water
- Gas
- Gas abandoned

Datum - Sea Level

Contour interval 50 ft.

Field boundary

Unit Plan boundary (Eocene and below)

Area excluded from Unit Plan

PLATE 1

T. 17 S. R. 18 E.

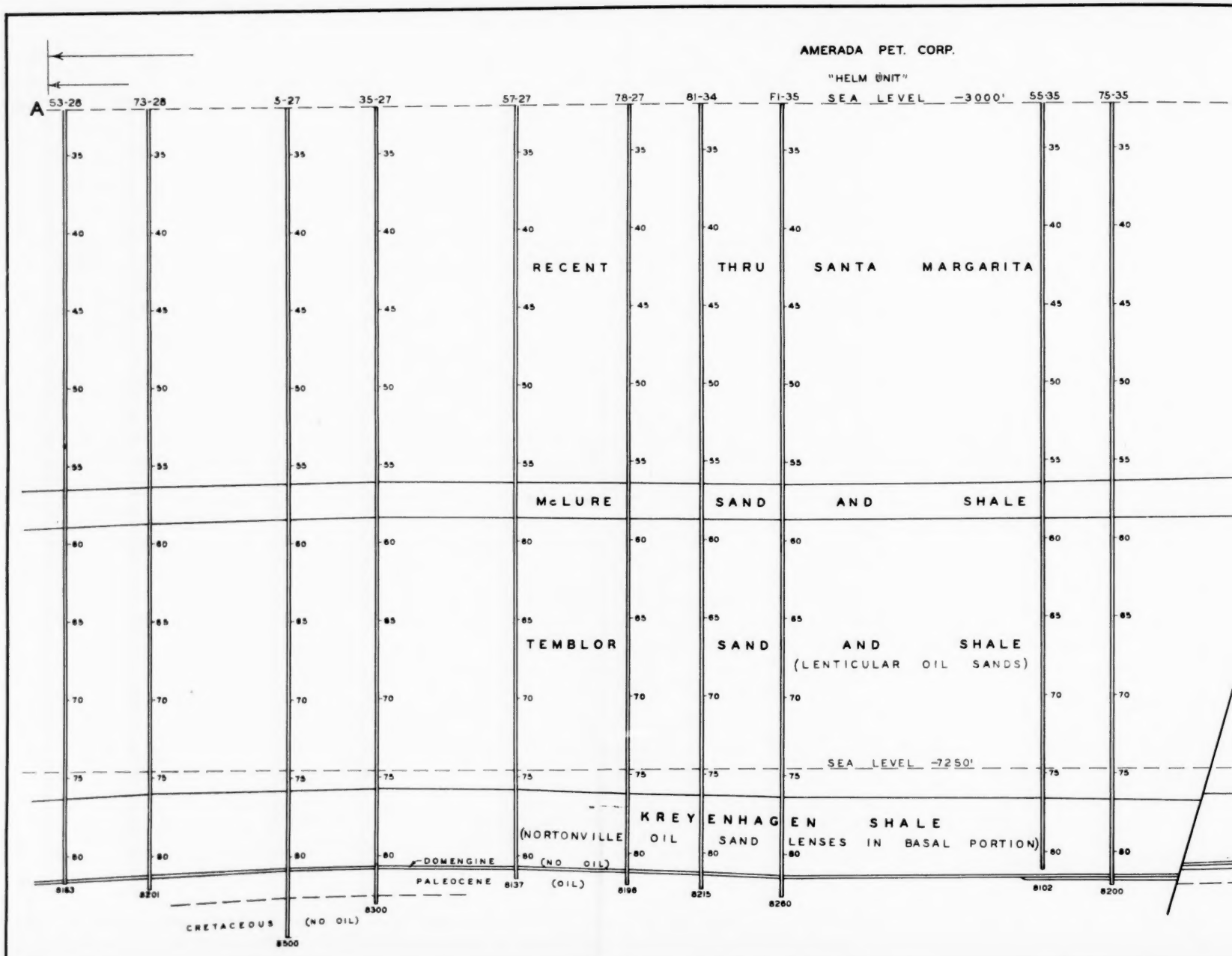
BURREL

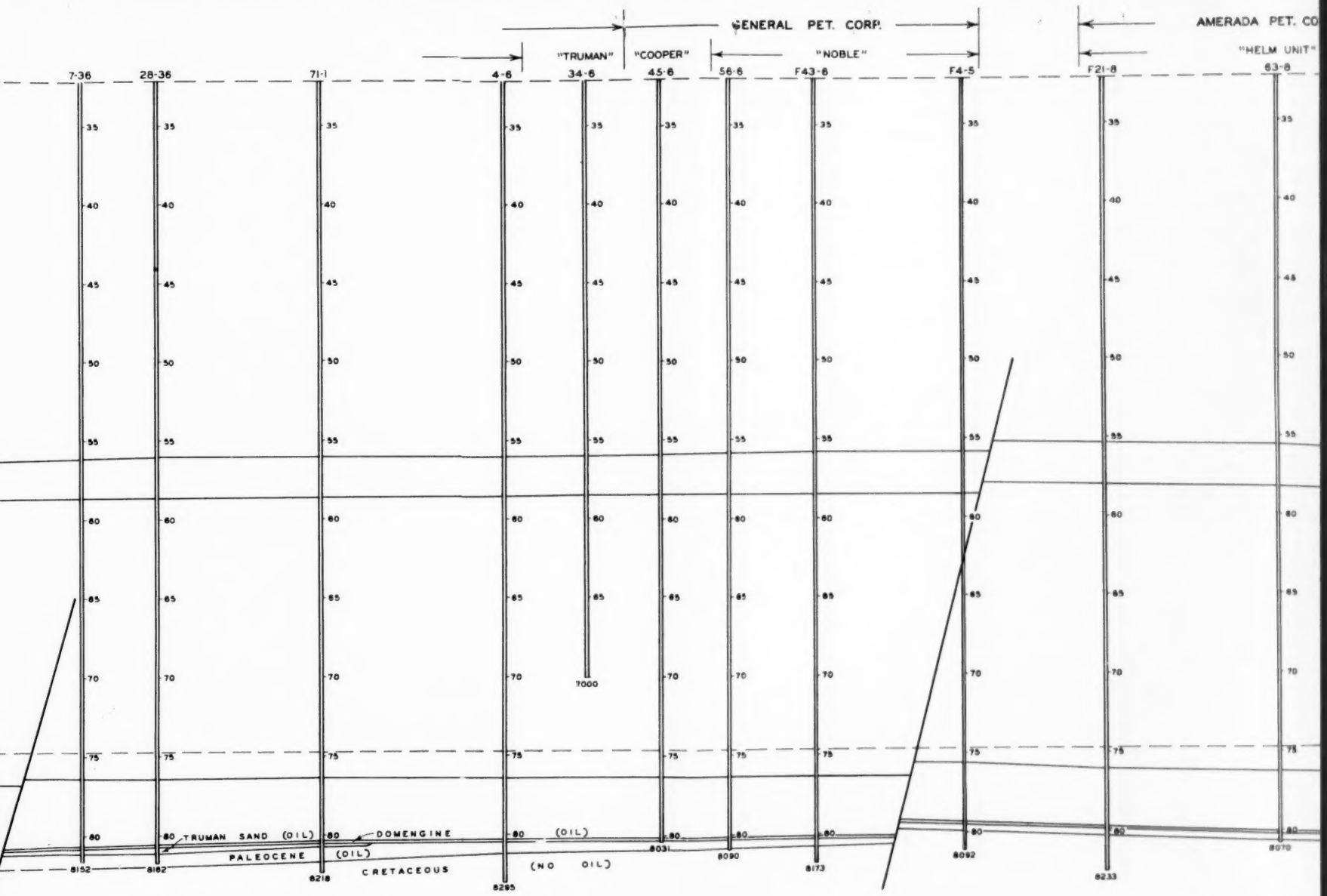
LANARE AREA

WHEATVILLE

RAILROAD

Murphy


AMERADA PET. CORP.
"HELM UNIT"
A
53-28
73-28
5-27
35-27
57-27
78-27
81-34
FI-35
SEA LEVEL -3000'
55-35
75-35
RECENT THRU SANTA MARGARITA
McLURE SAND AND SHALE
TEMBLOR SAND AND SHALE
(LENTICULAR OIL SANDS)
SEA LEVEL -7250'
KREYENHAGEN SHALE
(NORTONVILLE OIL SAND LENSES IN BASAL PORTION)
DOMENGINE
PALEOCENE
(NO OIL)
(OIL)
CRETACEOUS
(NO OIL)
8163
8201
8300
8137
8198
8215
8260
8102
8200
8500


GENERAL PET. CORP.
AMERADA PET. CO
"TRUMAN"
"COOPER"
"NOBLE"
"HELM UNIT"
7-36
28-36
71-1
4-6
34-6
45-6
56-6
F43-6
F4-5
F21-8
83-8
35
40
45
50
55
60
65
70
75
80
7000
8031
8090
8173
8092
8233
8070
8152
8162
8218
8295
TRUMAN SAND (OIL)
DOMENGINE
(OIL)
PALEOCENE
(OIL)
CRETACEOUS
(NO OIL)

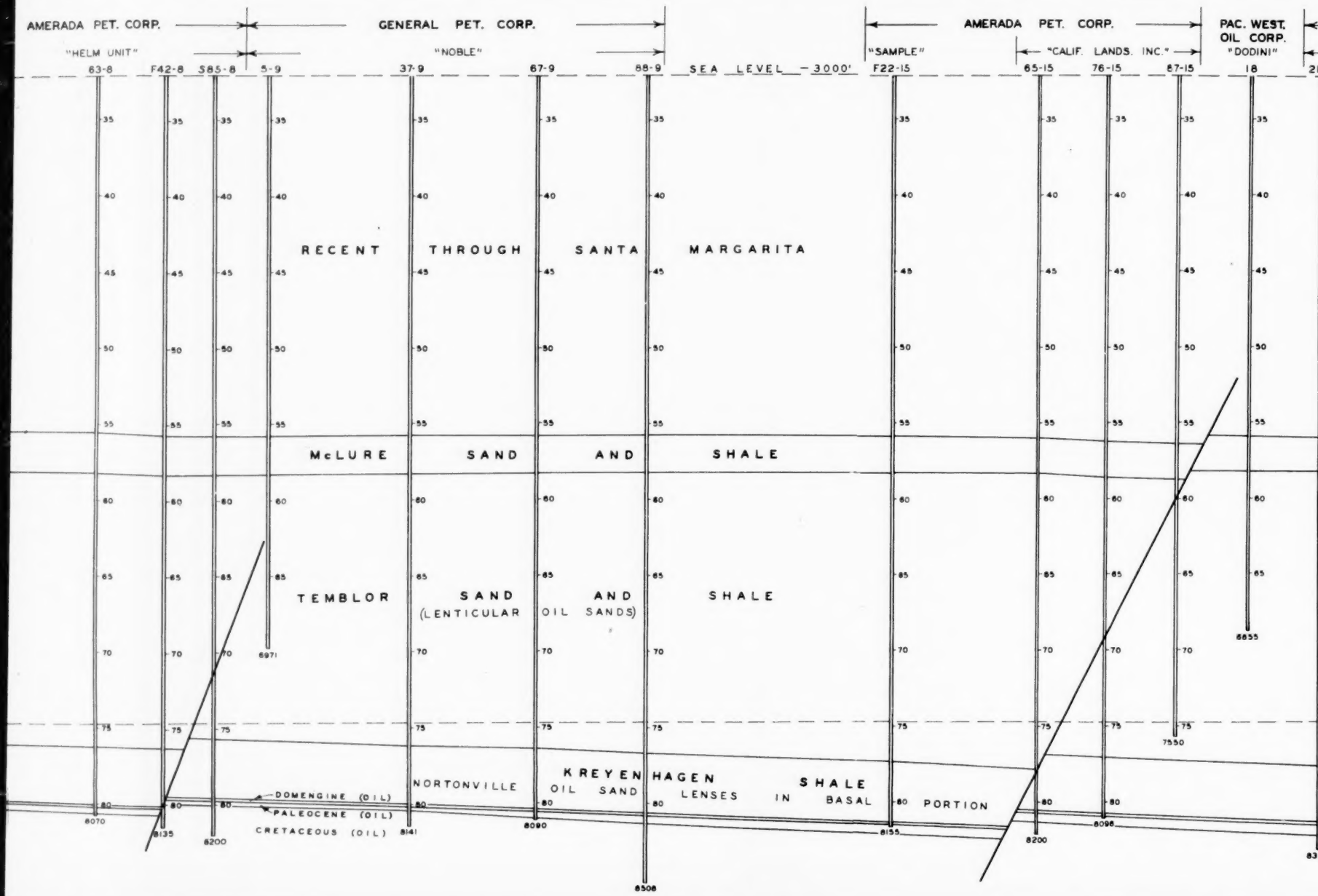
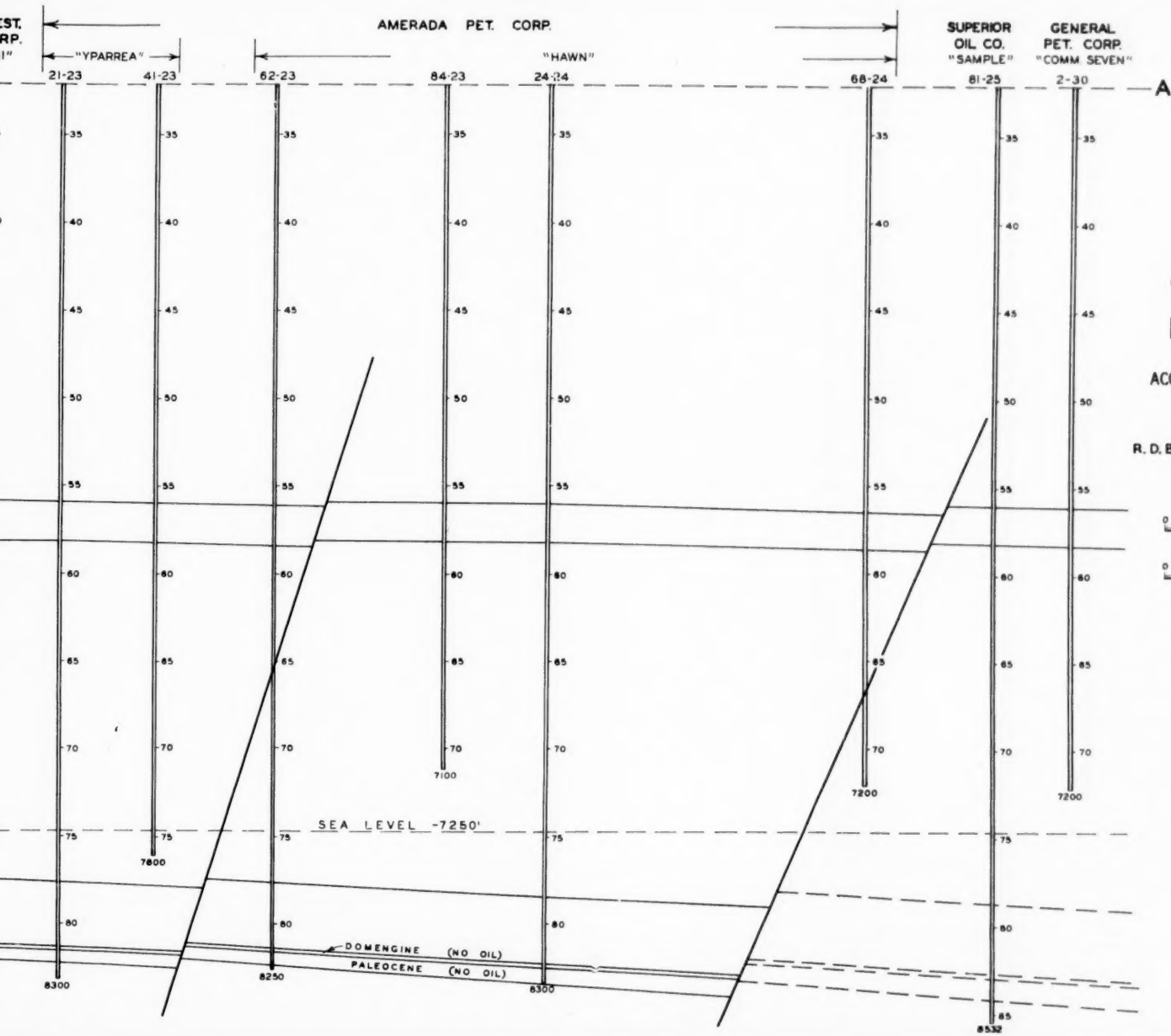

AMERADA PET. CORP.
"HELM UNIT"
63-8
F42-8
S85-8
5-9
GENERAL PET. CORP.
"NOBLE"
37-9
67-9
88-9
SEA LEVEL — 3000'
"SAMPLE"
F22-15
AMERADA PET. CORP.
"CALIF. LANDS. INC."
65-15
76-15
87-15
PAC. WEST. OIL CORP.
"DODINI"
18
RECENT THROUGH SANTA MARGARITA
McLURE SAND AND SHALE
TEMBLOR SAND (LENTICULAR OIL SANDS) AND SHALE
NORTONVILLE
KREYENHAGEN SHALE
OIL SAND LENSES IN BASAL PORTION
DOMENGINE (OIL)
PALEOCENE (OIL)
CRETACEOUS (OIL)
8971
8070
8135
8200
8141
8090
8508
8155
8200
8098
7550
8855

PLATE II



CROSS SECTION A-A

HELM OIL FIELD

ACCOMPANYING REPORT BY R. G. FRAME

DIVISION OF OIL & GAS

R. D. BUSH, STATE OIL & GAS SUPERVISOR

SCALE

VERTICAL

0 500 1000 1500 FT

HORIZONTAL

0 1000 2000 3000 FT

JULY 1950

FOR LOCATION SEE PLATE I

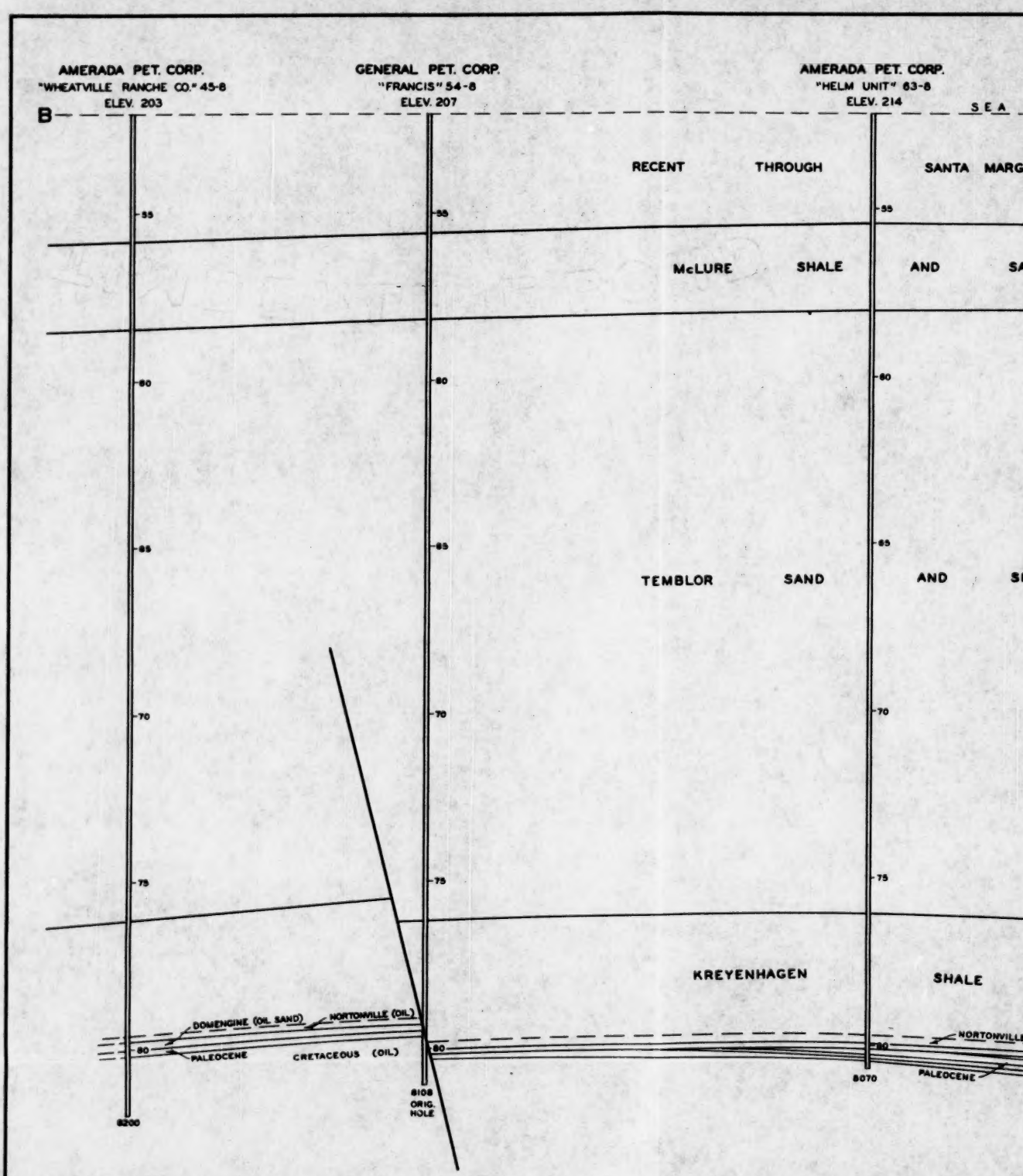
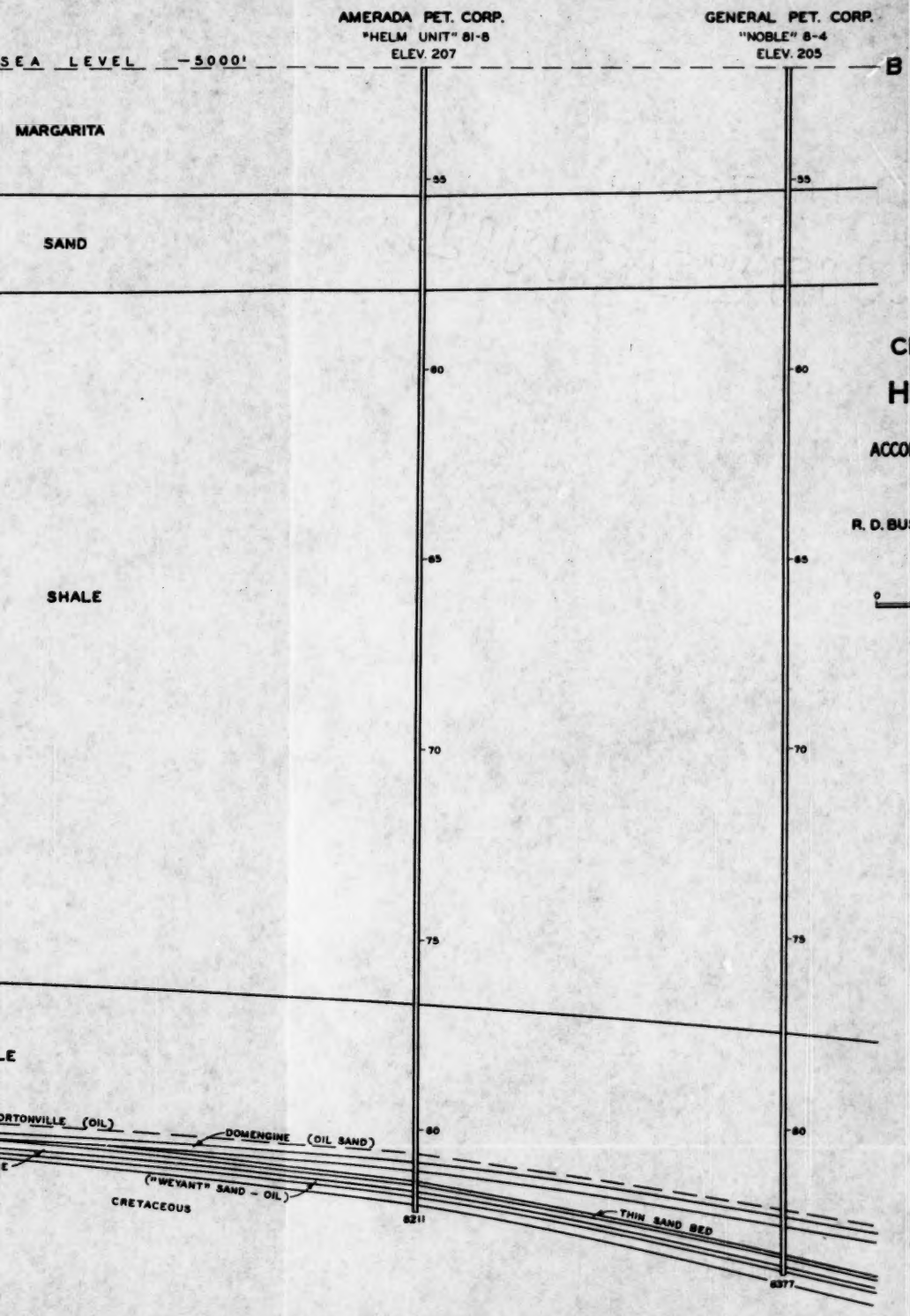

AMERADA PET. CORP.
"WHEATVILLE RANCHE CO." 45-8
ELEV. 203
GENERAL PET. CORP.
"FRANCIS" 54-8
ELEV. 207
AMERADA PET. CORP.
"HELM UNIT" 63-8
ELEV. 214
B
SEA
RECENT THROUGH SANTA MARG
McLURE SHALE AND SA
TEMBLOR SAND AND S
KREYENHAGEN SHALE
55
60
65
70
75
80
DOMENGINE (OIL SAND)
NORTONVILLE (OIL)
PALEOCENE
CRETACEOUS (OIL)
8200
8108
ORIG.
HOLE
8070
NORTONVILL
PALEOCENE

PLATE III



CROSS SECTION B-B
HELM OIL FIELD

ACCOMPANYING REPORT BY R.G. FRAME

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

SCALE
HORIZONTAL & VERTICAL
0 200 400 600 800 FT

JULY, 1950

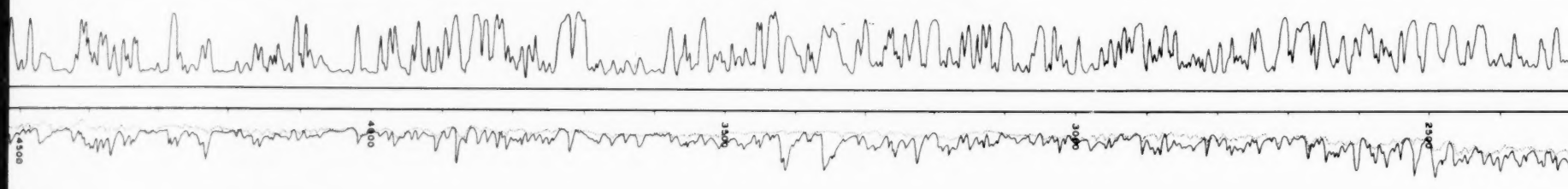
FOR LOCATION SEE PLATE I

CRETACEOUS
PALEOCENE
EOCENE
DOMENGINE
NORTONVILLE
EOCENE AND OLIGOCENE
KREYENHAGEN
TEMBLOR (ZILCH)
MI
MILLIVOLTS
OHMS m²/m
8000
7500
7000
6500
FINE FRIABLE FINELY GLAUCONITIC GY SD
GREENISH-GRAY FINE TO MEDIUM GLAUCONITIC SD. GRAY ZONE AT BASE
MOSTLY GRAY HARD MICACEOUS MASSIVE SILTSTONE. CONTAINS GRAY AND GREENISH GRAY BIOTITIC "WEYANT" SAND
VERY FINE GRAINED SILTY FIRM GRAY AND GRAYISH BROWN SAND. SOMETIMES GLAUCONITIC BIOTITIC AND CARBONACEOUS NAMED THE "WHEATVILLE" SAND SOME GRAY-BROWN SILTSTONE.
THIN STRAND OF SAND AT BASE NAMED THE "NOBLE" SAND
HARD CHOCOLATE BROWN SHALE, CONTAINS FISH SCALES, DIATOMS & FORAMS. SOME OF LOWER PORTION MAY BE NORTONVILLE.
FINE TO COARSE, SOMETIMES PEBBLY FRIABLE ILL-SORTED GRAY SAND AND GRAY-BROWN, REDDISH BROWN, AND GRAYISH-GREEN CLAYSTONE. MOSTLY CONTINENTAL. SOMETIMES CALLED THE ZILCH FORMATION. USUALLY CONTAINS LENTICULAR OIL SANDS.
20'±
25'±
60'±
120'±
400'±
1850'±

MIOCENE

	McLURE	SANTA MARGARITA	
	6000	5500	5000 4900
	GRAY SILTY SAND IN UPPER HALF, GRAYISH BROWN SHALE IN LOWER HALF. ALL THIS INTERVAL IS SHALE AT THE NORTH WEST END OF THE FIELD.	MOSTLY GRAY SAND WITH THIN BEDS OF SHALE.	
	220'±	610'±	

RECENT THROUGH PLIOCENE



ALTERNATING SANDS AND CLAY BEDS
NO CORES TAKEN IN THIS INTERVAL.

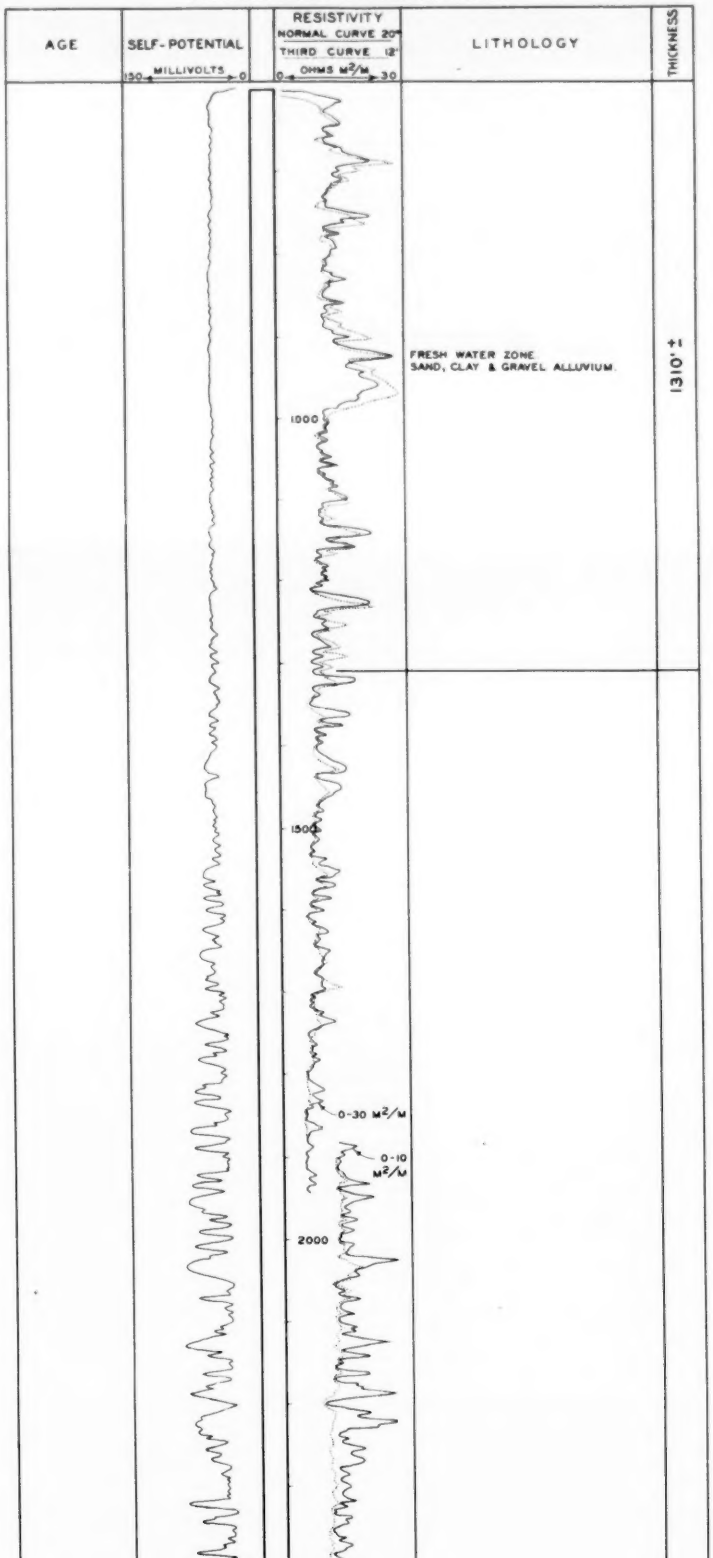
3650'±

PLATE IV

A TYPICAL
ELECTRIC LOG & STRATIGRAPHIC SECTION
OF
HELM OIL FIELD

ACCOMPANYING REPORT BY R. G. FRAME

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR



Nortonville ? (Upper Eocene)
Domengine (Middle Eocene)
Paleocene (the age of these beds, whether Eocene or Cretaceous, has not been definitely ascertained, so they are classified Paleocene, considered a transition stage between Cretaceous and Eocene)
Moreno and Panoche (Cretaceous)

The deepest penetration of the Cretaceous rocks was 2187 feet, made in the discovery well "Helm Unit" 31-34. It should be pointed out, however, that geologists are not unanimous as to the point that should be taken as the top of Cretaceous. The thicknesses and descriptions of the various formations as encountered on top of the structure in about the center of the field are given on Plate IV.

The McLure formation throughout the field is about the same thickness, but in the upper part of the formation there is a definite gradation from shale to sand in a southeasterly direction. The McLure and Temblor formations dip moderately to the southwest, even on the northeast flank of the fold where all the older formations dip to the northeast.

The Temblor formation thickens from 1730 feet at the northwest end of the field to 2040 feet at the southeast end (Plate II). It also increases in thickness from 1800 to 1960 feet in a northeasterly direction (Plate III).

The Kreyenhagen shale thins slightly to the southeast from 500 feet at the northwest end of the field to 380 feet at the southeast end (Plate II). The apparent slight thickening of the Kreyenhagen shale to the northeast as shown on Plate III is probably due to the structural dip of the beds and is not a true thickening. Wells in the Burrel area, some three miles northeast, encounter about the same amount of Kreyenhagen as that found in the Helm field.

The Domengine formation is represented in the Helm field by from 10 to 25 feet of sand interbedded with thin shale beds. The thickest portion of the Domengine is encountered in the southeast end of the field, where it reachs a maximum of 25 feet.

The variation in thickness of the Paleocene strata is due to erosion. Only about 20 feet is found in some wells on top of the structure, whereas 235 feet was drilled through on the flanks.

The 2187 feet of Cretaceous encountered in the discovery well "Clover" 31-34 consisted for the most part of very fine-grained dark gray sand with several hundred feet of dark gray siltstone and shale in the upper portion. Electric logs indicate that the 120-foot section of Wheatville sand in "Clover" 31-34 grades almost entirely to siltstone and shale in a southeast direction from the above well to the end of the field. Erosion may also have removed part of the sand.

OIL ZONES

Production in the Helm field is being obtained at the present time from sands of Temblor, Nortonville (?), Domengine, Paleocene and Cretaceous age; and also from one zone, the Truman, of undetermined age.

In the extreme northwest end of the field production occurs in only the Paleocene strata, while in the extreme southeast end of the field, only Temblor production is found. Throughout the remainder of the field, depending on permeability, lithology and structural position, any one

or more of the zones may be productive in any particular well. In a few wells in Sec. 8, T. 17 S., R. 18 E., all the zones except the Truman are productive.

The oil-bearing sands other than the Cretaceous and Truman are, with a few exceptions, rather thin and lenticular throughout the field.

The gravity of the oil is remarkably similar in all the zones and ranges from 29.0 to 35.0 degrees.

A brief description of each oil zone follows:

Temblor (Miocene)

Temblor production, although widespread throughout the field, is not present in all wells. The oil occurs in thin lenticular sands usually ranging from five to 15 feet in thickness and found anywhere between 6100 and 7500 feet in depth. A few wells in the southeasterly part of the field, namely; Amerada Petroleum Corporation "Hawn" 24-14, "Hawn" 27-14 and "Hawn" 62-23 encountered an unusual thickness of 40 feet of Temblor oil sand in one bed. A maximum of eight separate oil sands of this formation have been counted in some wells. A rather thin gas cap was originally present in the Temblor sands in the northwest end of the field.

A history of the production of one 15-foot sand occurring in the interval from 7300 to 7315 feet in the discovery well "Clover" 31-34, is briefly as follows: During the first month the well averaged about 1,000 Mcf. of gas and 38 barrels of 64.7-degree gravity condensate per day, which increased by the end of three months to 2,333 Mcf. of gas and 207 barrels of condensate per day. At the end of 15 months, the well was making approximately 235 barrels of 65-degree gravity condensate and nearly 5,000 Mcf. of gas per day. Water then began to appear and increased rapidly while the production of condensate and gas decreased until, by the end of 19 months, the well averaged less than 74 barrels of 56-degree gravity oil, about 2,000 Mcf. of gas, and 460 barrels of salt water per day. Shortly afterward, the well sanded up, the perforations were plugged with cement, and the well recompleted in another Temblor sand.

Throughout the field extreme variation is experienced in the productivity and life of the various Temblor oil sands. Some sands initially produce from 150 to 200 barrels of oil per day, but in one month's time the production may drop to approximately 100 barrels of fluid a day cutting 85 percent water and soon become noncommercial. In rare cases, however, a sand may initially produce from 250 to 300 barrels of 35.0-degree gravity clean oil and five years later still be producing from 150 to 200 barrels of relatively clean oil per day.

Generally speaking, the production of the Temblor sands is short-lived and many wells, after depleting one or more sands, have already been abandoned. Of course, the wells in which seven or eight different oil sand members are present will have a comparatively long productive life. When any one sand is depleted, it is merely plugged off and another sand or two perforated for production.

Nortonville

The Nortonville oil zone consists of thin lenticular sands occurring in the basal portion of the Kreyenhagen shale. The maximum thickness of any one sand is about 10 feet. There is disagreement among geologists as

to whether the Nortonville sands should be considered a part of a separate formation or merely basal Kreyenhagen. The writer favors the latter.

The Nortonville zone is present throughout most of the field, but in many wells the sand has graded to siltstone and in many other wells it is wet. In many cases where the Nortonville is wet, production is secured from the Domengine, Paleocene or Cretaceous sands below it.

In wells high on the structure, the Nortonville production consists mostly of gas and 60- to 64-degree gravity condensate and on the flanks, of dark oil ranging from 29- to 31-degree gravity. Only a very few wells in the field have been produced solely from the Nortonville zone. The sands are usually tight and silty, and owing to their thinness the production decline is rapid. One well, for example, completed in three thin sands in a 20-foot interval, flowed 103 barrels per day of 31-degree gravity oil for the first month, but flowed only for two months. It was then put on the pump for an average of 85 barrels per day during the first month, declining to 20 barrels per day by the end of two years.

Domengine

The Domengine zone is encountered immediately below the Nortonville, usually with only five to fifteen feet of hard brown shale intervening between the two zones. Throughout most of the field, the Domengine consists of three sand members, varying from four to eight feet in thickness, separated by thin beds of gray shale or siltstone. The sand is usually fine-grained, greenish-gray, fairly hard, silty and glauconitic. The entire interval ranges from 10 to 25 feet in thickness.

Cores taken and formation tests made in wells in the northwest end of the field indicate the sand there to be very tight, yielding only gas. In the southeastern end of the field, the Domengine sand is wet and production is secured only from Temblor sands.

The productive life of the Domengine wells depends, as do wells in other formations, on structural position and sand thickness. Where the sand is thin the oil production soon drops and the well starts to make excess gas, if located high on the structure, and excess water, if low on the structure.

Only a few wells were completed solely in the Domengine sand. Usually the sands above and below, namely the Nortonville and Weyant respectively, have been perforated to give additional production. The Domengine sand by itself did not produce any big or long-lived wells. At the end of four years, the production of oil was usually down to 15 barrels or less per day. One well in the central part of the field, namely General Petroleum Corporation well No. "Francis" 65-8, flowed during the first month at the average daily rate of 118 barrels of 32.1-degree gravity clean oil with a gas-oil ratio of 1750 cubic feet of gas per barrel. Two years later, the well was still flowing and was producing at the rate of 79 barrels of oil and one barrel of water per day with a gas-oil ratio of 2500. At the end of four years, the well was producing five barrels of oil and 27 barrels of water per day. The Domengine sand was later plugged off and the well recompleted in the Nortonville sand.

Truman

The Truman sand zone consists of a large lens of light gray usually well-sorted friable quartz sand that was laid down in a Paleocene basin prior to the deposition of the Domengine sand which blankets it. Due to

lack of faunal evidence, the exact age of this particular sand has not been determined. The areal extent of the lens is shown on Plate I.

The Truman sand is lithologically different from the silty greenish-gray Domengine sand immediately above it, and several wells have cored an impermeable shell before entering it. A study of the production characteristics, pressures and gas-oil interface indicates that the Truman sand is a distinct reservoir separate from the Domengine zone.

The sand varies in thickness from zero to a maximum of 35 feet, with the thickest portion occurring along the apex of the anticline.

The Truman sand develops quite abruptly on at least three sides of the Paleocene basin. From 20 to 30 feet of sand is present in wells on the northwest, northeast and southeast sides of the lens, only one location away from zero deposition. On the southwest flank, an outpost well No. "Sonnichsen" 53-2 had 15 feet of the Truman sand present but it was wet and nonproductive.

Some of the better completions in the field have been from the Truman sand. The first well completed in this sand was Amerada Petroleum Corporation well No. "Truman" F34-36 (now "Helm Unit" F34-36), Sec. 36, T. 16 S., R. 17 E., from which the new sand derived its name. "Helm Unit" F34-36 was completed in November 1942, and during December the well averaged 160 barrels per day of clean 31-degree gravity oil with a gas-oil ratio of 630 cubic feet per barrel. One year later the well was producing 213 barrels of oil per day with a ratio of 596 cubic feet of gas per barrel. By the end of three years the well was still averaging 135 barrels of clean oil per day with 1500 cubic feet of gas per barrel. A few months later bottom water began to appear and increased rapidly; so the bottom 15 feet of the sand was plugged with cement and the well recompleted in the upper 10 feet of the Truman sand for an average of 58 barrels of 30-degree gravity clean oil per day and 780 cubic feet of gas per barrel. Several other wells in the same pool were completed for over 165 barrels of 31-degree gravity oil per day and four and one-half years later were still producing at the rate of about 125 barrels per day.

Paleocene

Due to unconformity, the first Paleocene oil sand (locally named the Weyant sand) may appear anywhere from 10 to 100 feet below the Domengine sand. On top of the structure, the Paleocene is eroded away until only about 10 or 12 feet of Paleocene sediments lie between the Domengine and Cretaceous strata.

The Weyant sand is usually 10 or 12 feet thick throughout the greater part of the field, but is not present at all in some wells in the southeastern end. Other thin lenticular Paleocene sands are present in some wells either above or below the Weyant sand, but very little production has been secured from them.

The best Paleocene wells are found in the northwestern end of the field, but even there they decline rapidly. One well averaged 155 barrels per day of 31-degree gravity oil for the first month's production, but was producing only 32 barrels per day one year later. Another well did much better in averaging 180 barrels per day of 32-degree oil for the first month, 121 barrels per day one year later and 59 barrels per day at the end of three and one-half years. The latter example of production is the exception, however, rather than the rule. Another well in the central part of the field, producing from two sands of four and 10 feet thick

respectively, averaged 124 barrels per day of 34-degree oil during the first month, but only 28 barrels per day one year later. The gas-oil ratio increased from 4,350 to 15,700 cubic feet of gas per barrel of oil during this period. No production has been secured from the Paleocene southeast of Sec. 9, T. 17 S., R. 18 E.

Cretaceous

The areal extent of Cretaceous production is the smallest of any of the productive zones. It is found only above the Domengine 7850-foot subsea contour in Secs. 5, 8 and 9, as shown on Plate No. I. The main sand body has been named the Wheatville sand after Amerada Petroleum Corporation well No. "Wheatville Ranche Co." F 21-8 (now "Helm Unit" F 21-8), which first tested the zone. Several thin sands immediately below the Wheatville are also productive in some wells and these have been called the Noble sands, named after General Petroleum Corporation well No. "Noble" F 2-9 in which they were first tested. This well was completed in both the Noble and Wheatville sands.

The Cretaceous sands are very fine-grained, sometimes silty and do not readily yield oil. For this reason only a very few wells were completed solely in the Cretaceous. In most of the wells one or more of the Paleocene, Domengine and Nortonville sands were also perforated in order to increase the production.

The Wheatville sand is a massive sand body varying from 15 to 120 feet in thickness within the field limits, and separated from the Paleocene oil sand by about 10 feet of siltstone. A maximum of about 75 feet proved to contain oil and gas. The electric logs of the wells which penetrated the Cretaceous show the Wheatville sand to be a uniform sand body about 120 feet thick in the northwest end of the field, thinning progressively to the southeast where it apparently grades into siltstone containing several thin sand stringers.

The Noble sand consists of from three to six thin sands ranging from three to four feet in thickness.

One of the better completions in which both the Wheatville and Noble sands were perforated was General Petroleum Corporation well No. "Noble" F 2-9, which produced during the first month at an average rate of 158 barrels per day of 31-degree gravity oil with a cut of 2.0 percent and a gas-oil ratio of 456 cubic feet per barrel of oil. Three years later the well was producing at an average rate of 41 barrels per day of clean oil with a gas-oil ratio of 690 cubic feet per barrel.

WATER CONDITIONS

In a long narrow field producing from a series of thin sands, water trouble is to be expected, and in the Helm field many wells have had a very short life of clean oil production before edge water showed up in appreciable quantities.

The main obstacle to successful elimination of water throughout the field is the fact that in many wells only seven to 10 feet of impervious material separates the oil sand from a water sand. This condition has called for great accuracy in measurements for gun perforating, and in many instances one or more recement jobs have been necessary to shut off the water.

The Temblor waters are extremely salty varying from 2200 to 2800 grains of salt per gallon in most of the samples tested. A few samples

tested from 1300 to 1700 grains per gallon. The salt content of the water in the deeper Nortonville to Cretaceous zones, excepting the Truman, does not vary greatly and tests from 800 to 1100 grains per gallon. The water in the Truman zone usually contains from 550 to 650 grains of salt per gallon.

In a few wells, during testing operations, clear salt water flowed at rates varying from 200 to 700 barrels per day. But, in general throughout the field, the water pressures in all the zones were remarkably close to the calculated hydrostatic head.

DRILLING PRACTICE

No particular difficulty was experienced in drilling operations in the Helm field. In fact, drilling was probably easier than in most fields because of the great thickness of valley alluvium and unconsolidated continental Temblor beds. The rotary drilling method was of course used throughout the field. Practically all of the wells were drilled by contractors. The drilling time varied considerably. An average time of 22 days was calculated for Eocene wells with depths of about 8200 feet and 15 days for Miocene wells of about 7200 feet. The best time noted was 13 days for an Eocene well 8200 feet deep, and eight days for a Miocene well 7250 feet deep. The above figures are total elapsed time from date of spudding until total depth was reached. From five to 30 days were necessary, depending on the amount of cementing and testing done, to complete the wells.

In the great majority of wells 11¾-inch O.D. casing was used for the surface casing and 5½-inch O.D. for the water string. In some wells 10¾-inch, 12¾-inch or 13⅜-inch casing was used for the surface casing and 6⅝-inch or 7-inch for the water string. The average drilling and casing program was as follows: A 16-inch hole was drilled to 600 feet or more and 11¾-inch O.D. 47-lb. casing was cemented on bottom with sufficient cement to reach the surface. A 10⅝-inch hole was then drilled to just above the objective oil zone and an 8½-inch hole either drilled or cored through the oil zone. Some operators preferred to core through the oil zone with the conventional core barrel and others drilled through the entire zone, ran the electrical log and took sidewall samples of any promising sands. A shoulder could then be formed from 10⅝-inch to 8½-inch hole for the purpose of formation testing. The 5½-inch casing was then cemented in either an 8½, 9⅞ or 10⅝-inch hole. One thousand sacks of cement was commonly pumped around the shoe of the 5½-inch casing to reach well above any productive sands in the Temblor zone. The 5½-inch casing was nearly always cemented solid through the oil zone and gun perforated for production. In a few wells, a combination string was used and the 5½-inch casing cemented through ports above the oil sand.

Adequate blow-out prevention equipment was definitely necessary during drilling operations. Nearly all wells were equipped with either two high pressure Shaffer gates, or a Hydril or Regan blow-out preventer and one Shaffer gate. Where two Shaffer gates were used, one was equipped with rams to pack off around the drill pipe or tubing and the other for complete shut off when the pipe was out of the hole. One operator also used a Hosmer type blow-out preventer in addition to the above.

Another operator installed a Hydril blow-out preventer above the two Shaffer gates. Only one serious blow-out occurred. On December 18, 1943, General Petroleum Corporation well No. "Noble" F 43-6, Sec. 6, T. 17 S., R. 18 E., while in the process of running 5¾-inch casing, blew out through the mud flow line. The well caught fire before the flow line gate could be closed and blew wild for about two and one-half hours before sanding up. Two men died as a result of burns. Two big cement trucks, the derrick, and practically all the equipment were destroyed resulting in damage estimated at over $200,000.

Only prompt and effective use of the blow-out prevention equipment averted similar disasters in several other wells.

PRODUCTION

In the Helm field no particular attempt has been made to segregate the oil and gas production, other than keeping that of the Miocene (Temblor) separate from that of the deeper Eocene and Cretaceous zones. From one to five Temblor sands may be produced simultaneously in a well. The deeper wells may be completed in any one or more of the Nortonville, Domengine, Truman, Paleocene or Cretaceous oil zones. All of the sands, where structurally high, produce mostly gas with condensate. Since the Helm Unit Plan became effective on December 31, 1945, many of the high gas-oil ratio wells have been shut in.

Following is a summary through 1949 of the production since the field was discovered.

Year	*Oil (bbl.)*	*Water (bbl.)*	*Gas (Mcf.)*
1941	2,549	9	53,126
1942	80,805	671	771,073
1943	166,918	40,023	1,379,926
1944	531,629	41,825	1,467,643
1945	1,404,653	96,008	2,028,837
1946	2,364,759	300,596	6,085,946
1947	2,270,031	773,236	5,724,203
1948	1,763,793	1,239,046	5,195,914
1949	1,403,138	1,334,707	4,474,890
Total	9,988,275	3,826,121	27,181,558

The drop in the oil and gas production after 1946 does not reflect a true rate of decline for the field because an average of 23 wells out of an average total of 99 potential wells were shut in during 1949.

CONCLUSION

Some proved acreage, as can be seen from a study of the contour map (Plate I) still remains to be drilled in the Helm field. Nearly all of the undrilled land lies in the unitized part of the field, and most of it is in the gas cap area. Hence it is unlikely that the area will be drilled up in the near future. At the present time, June 30, 1950, none of the operators in the field has any plans for future drilling.

The prospects for finding deeper production in the Helm field are extremely poor as nearly 220 feet of Cretaceous strata has been penetrated without encountering any new production below the Wheatville and Noble sands.

August, 1950

KERN BLUFF OIL FIELD

By Charles H. Corwin [1]

INTRODUCTION

The Kern Bluff field is located in the area between the Kern River field and the Ant Hill field, in the southeastern part of the San Joaquin Valley, approximately six miles northeast of Bakersfield, California. The field is divided into two separate fault blocks, referred to as the northern area and the southern area. The combined productive area lies in Sec. 12 and 13, T. 29 S., R. 28 E., M. D. B. & M., and Sec. 7 and 18, T. 29 S., R. 29 E. The topography of the field is a comparatively level basin, surrounded by gentle rolling, barren hills. Proved acreage, as of December 21, 1949, was 490 acres.

ACKNOWLEDGMENTS

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The following illustrations accompany this report:

Plate I. Contour map at top of Main oil sand ("V" marker), and typical well log.

Plate II. Cross section A-A, longitudinal section in northern area.

Plate III. Cross section B-B, transverse section in northern area.

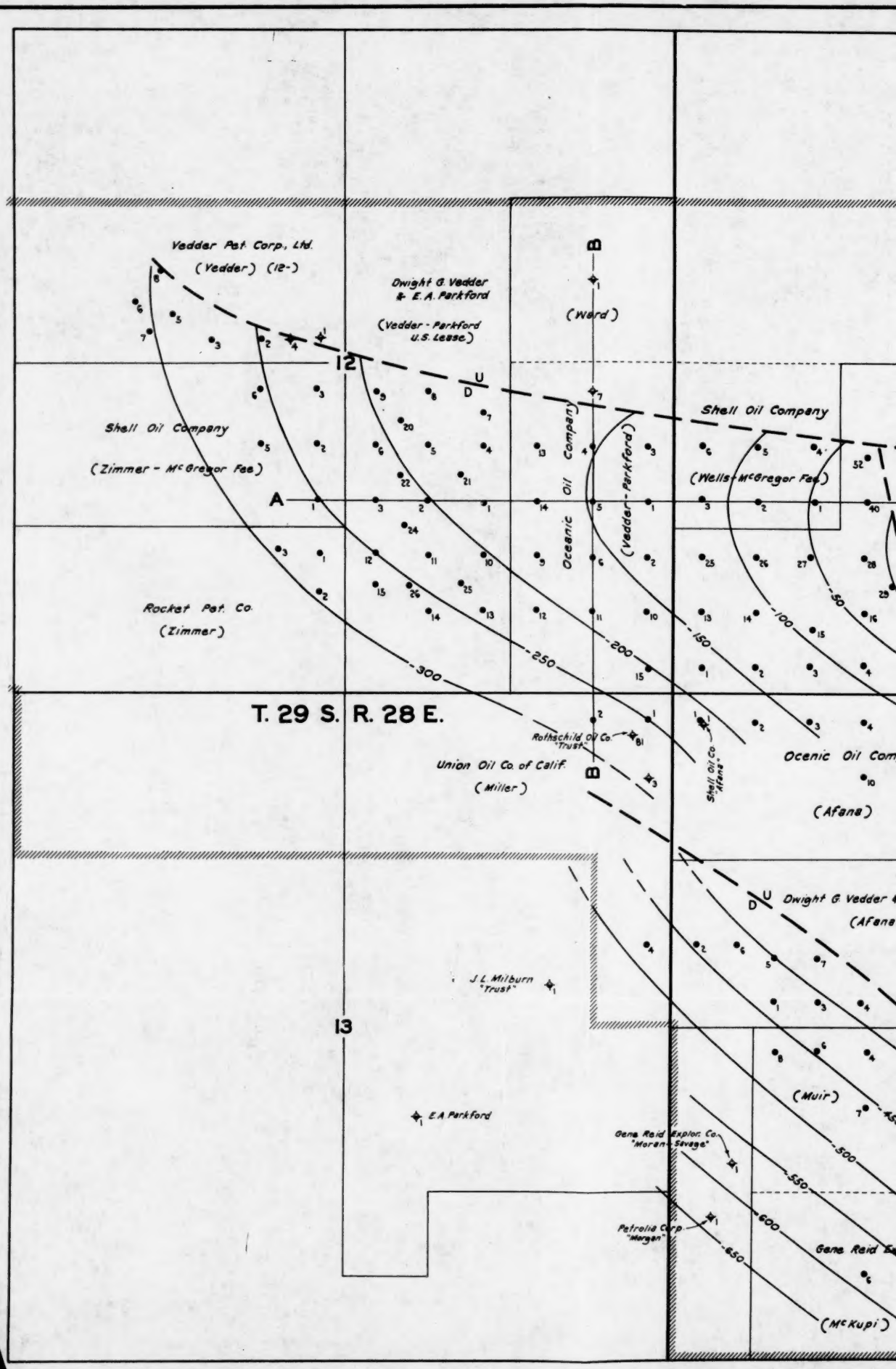
Plate IV. Cross section C-C, transverse section in southern area.

HISTORY

On February 4, 1944, Shell Oil Company well No. "Afana" 1 was spudded as a test well in the northwest corner of Sec. 18, T. 29 S., R. 29 E., and was drilled to a total depth of 1143 feet, encountering oil sands in the interval from 840 to 1035 feet. The well was completed from this interval for an initial production of 18 barrels per day of 15-degree gravity oil, cutting 65 per cent. After four months, production declined to seven barrels per day, and the well was abandoned. Shell Oil Company well No. "Afana" 2, which was drilled approximately 2200 feet to the southeast of "Afana" 1, in the same section, did not obtain commercial production and was abandoned. Early in 1945, Rothschild Oil Company drilled well No. "Trust" 81 in the northeast corner of Sec. 13, T. 29 S., R. 28 E., to a depth of 4810 feet, the deepest penetration in the field to date. The top of the Upper Vedder sand (gray) was encountered at 4720 feet. In coring below the basal Kern River-Chanac series, 50 feet of oil sand was encountered, but was not tested.

No further activity took place in the area until August, 1947, when Oceanic Oil Company filed notice to drill well No. "Needham-Bloemer" 15 (formerly "Needham-Bloemer" 1) in the southwest quarter of Sec. 7,

[1] Assistant Oil and Gas Engineer, Division of Oil and Gas.


Vedder Pet. Corp., Ltd.
(Vedder) (12-)
Dwight G. Vedder
& E. A. Parkford
(Vedder - Parkford
U.S. Lease)
(Ward)
12
U
D
Shell Oil Company
(Zimmer - McGregor Fee)
Shell Oil Company
(Wells - McGregor Fee)
Oceanic Oil Company
(Vedder - Parkford)
A
B
Rocket Pet. Co.
(Zimmer)
T. 29 S. R. 28 E.
Rothschild Oil Co.
"Trust"
Union Oil Co. of Calif.
(Miller)
Shell Oil Co.
"Afana"
Ocenic Oil Com
(Afana)
Dwight G. Vedder
(Afana
J. L. Milburn
"Trust"
13
E. A. Parkford
(Muir)
Gene Reid Explor. Co.
"Moran - Savage"
Petrolia Corp.
"Morgan"
Gene Reid
(McKupi)
50
100
150
200
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500
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650

PLATE 1

MAP OF
KERN BLUFF OIL FIELD
KERN COUNTY, CALIFORNIA
SHOWING CONTOURS ON
TOP OF MAIN OIL SAND ("U" MARKER)

ACCOMPANYING REPORT BY C. H. CORWIN

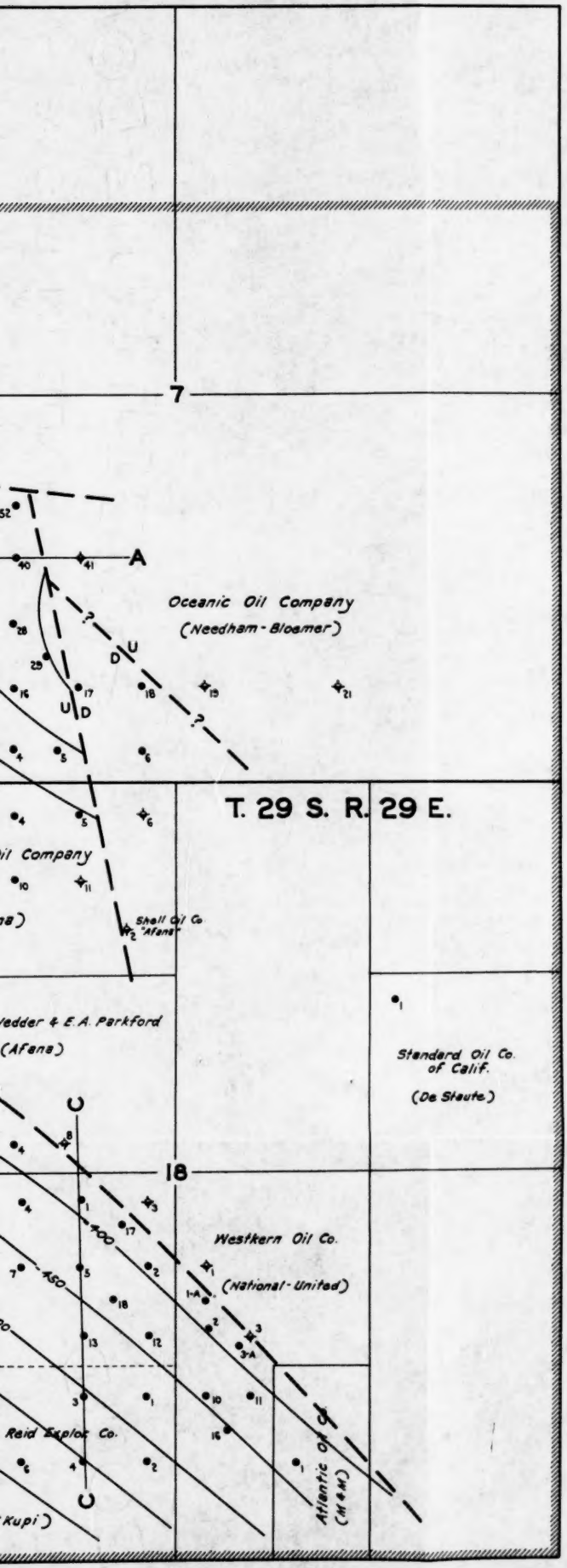
DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

SCALE
0 500 1000 1500 2000 2500 FT.

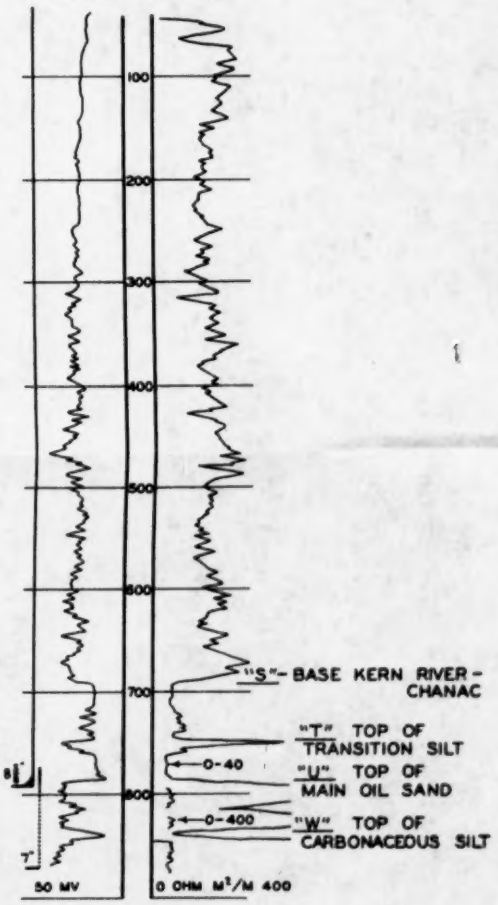
MAY 1950

LEGEND
- Uncompleted drilling
- Uncompleted idle
- Uncompleted abandoned
- Completed producing
- Completed idle
- Completed producing
- Water
- Abandoned converted to water
- Gas
- Gas abandoned

Datum - Sea Level
Contour interval 50 ft.
Field boundary



TYPICAL WELL LOG



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HISTORY

On February 4, 1944, Shell Oil Company well No. "Afana" 1 was spudded as a test well in the northwest corner of Sec. 18, T. 29 S., R. 29 E., and was drilled to a total depth of 1143 feet, encountering oil sands in the interval from 840 to 1035 feet. The well was completed from this interval for an initial production of 18 barrels per day of 15-degree gravity oil, cutting 65 per cent. After four months, production declined to seven barrels per day, and the well was abandoned. Shell Oil Company well No. "Afana" 2, which was drilled approximately 2200 feet to the southeast of "Afana" 1, in the same section, did not obtain commercial production and was abandoned. Early in 1945, Rothschild Oil Company drilled well No. "Trust" 81 in the northeast corner of Sec. 13, T. 29 S., R. 28 E., to a depth of 4810 feet, the deepest penetration in the field to date. The top of the Upper Vedder sand (gray) was encountered at 4720 feet. In coring below the basal Kern River-Chanac series, 50 feet of oil sand was encountered, but was not tested.

No further activity took place in the area until August, 1947, when Oceanic Oil Company filed notice to drill well No. "Needham-Bloemer" 15 (formerly "Needham-Bloemer" 1) in the southwest quarter of Sec. 7,

[a] Assistant Oil and Gas Engineer, Division of Oil and Gas.

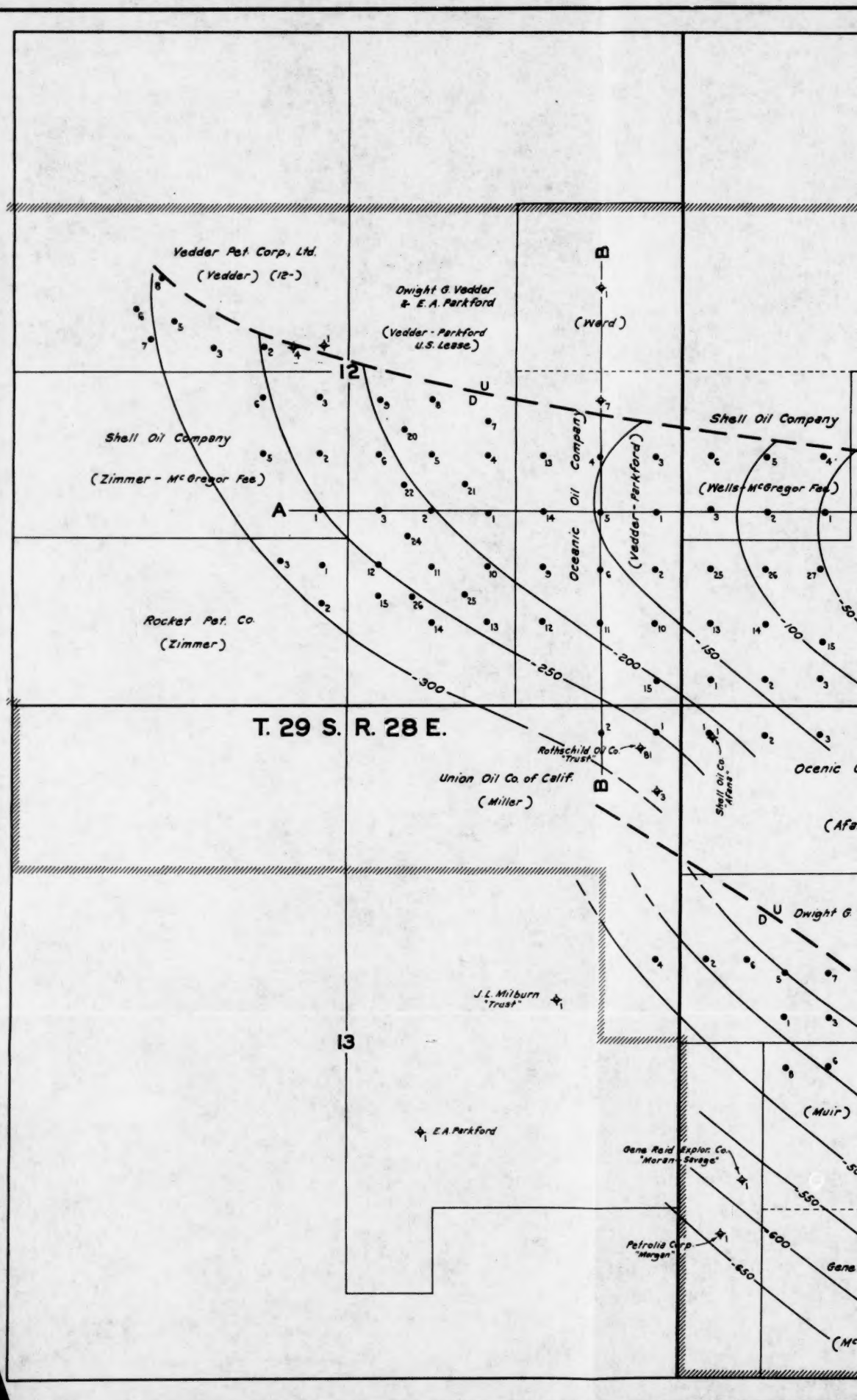

Vedder Pet. Corp., Ltd.
(Vedder) (12-)
Dwight G. Vedder
& E. A. Parkford
(Vedder - Parkford
U.S. Lease)
(Ward)
12
U
D
Shell Oil Company
(Zimmer - McGregor Fee)
Shell Oil Company
(Wells-McGregor Fee)
Oceanic Oil Company
(Vedder-Parkford)
A
B
Rocket Pet. Co.
(Zimmer)
300
250
200
150
100
T. 29 S. R. 28 E.
Rothschild Oil Co.
"Trust"
Union Oil Co. of Calif.
(Miller)
Shell Oil Co.
"Kent"
Ocenic
(Afa
Dwight G.
J. L. Milburn
"Trust"
13
E. A. Parkford
Gene Reid Explor. Co.
"Moran-Savage"
Petrolia Corp.
"Morgan"
550
600
650
(Muir)
Gene
(Mc

PLATE I

MAP OF
KERN BLUFF OIL FIELD
KERN COUNTY, CALIFORNIA
SHOWING CONTOURS ON
TOP OF MAIN OIL SAND ("U" MARKER)

ACCOMPANYING REPORT BY C. H. CORWIN

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

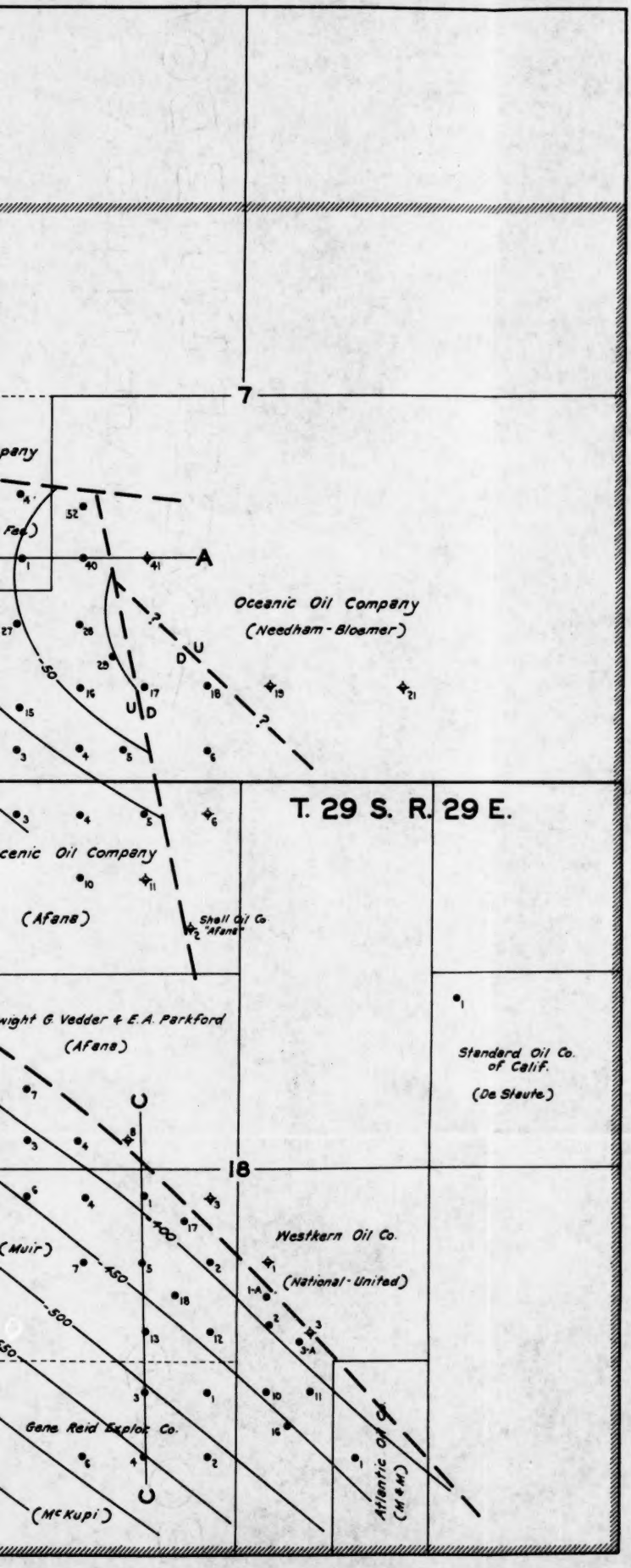
SCALE
0 500 1000 1500 2000 2500 FT.

MAY 1950

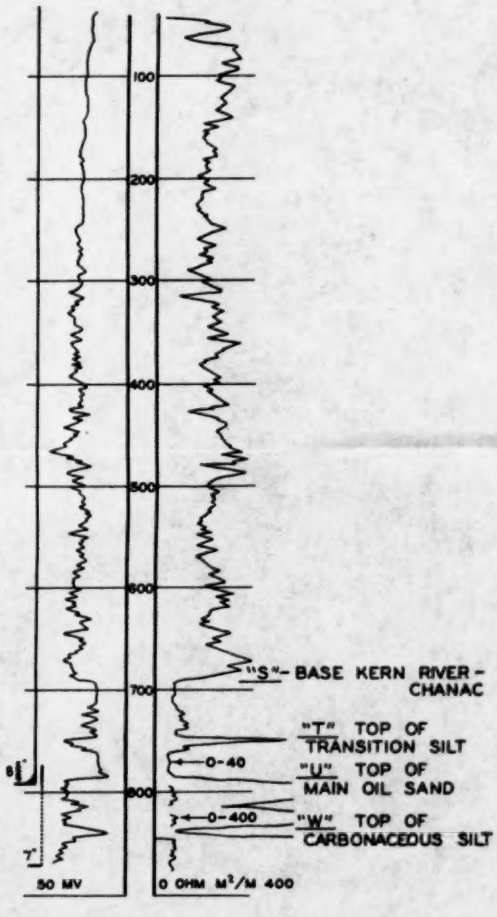
LEGEND

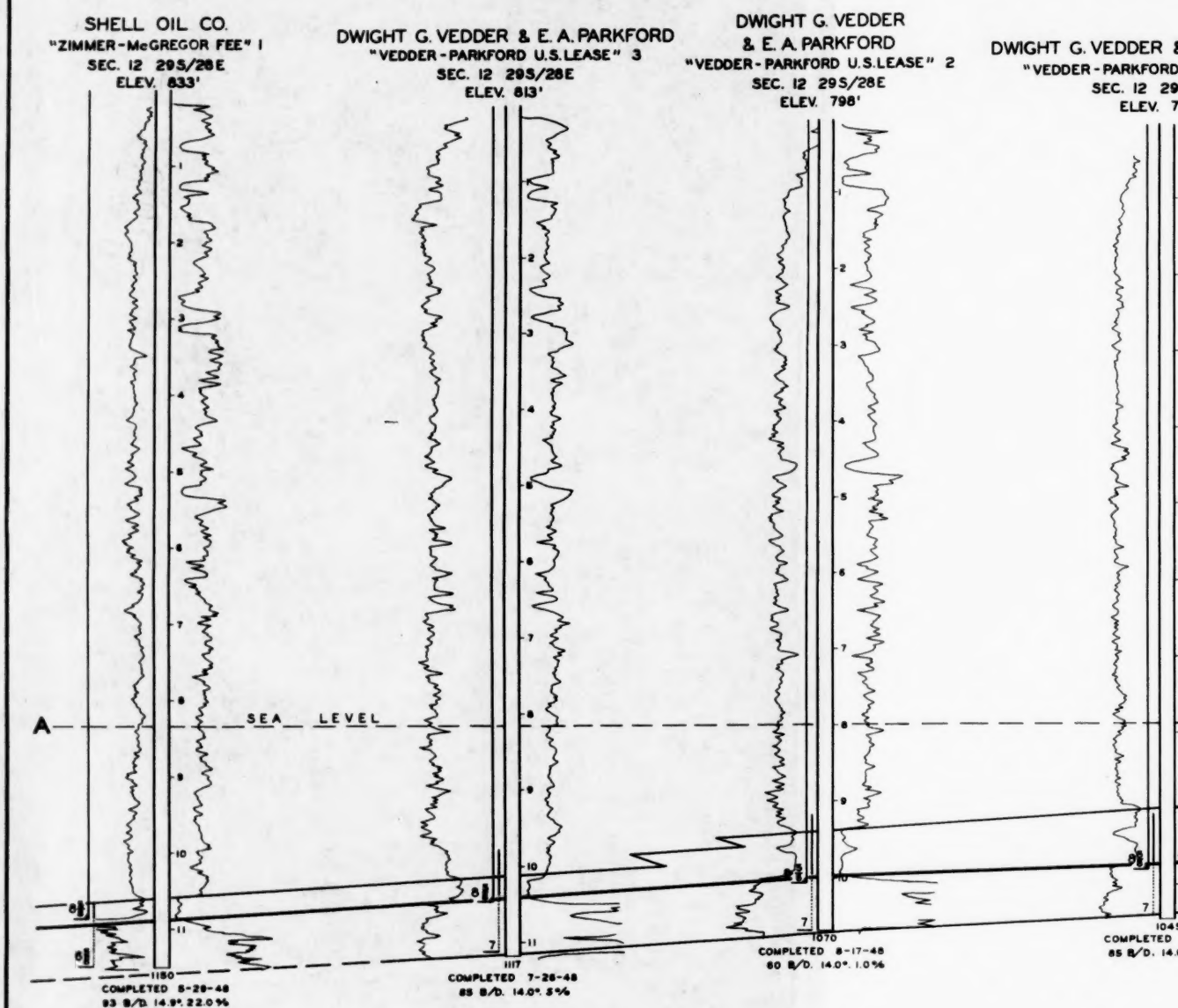
- Uncompleted drilling
- Uncompleted idle
- Uncompleted abandoned
- Completed producing
- Completed idle
- Completed producing
- Water
- Abandoned converted to water
- Gas
- Gas abandoned

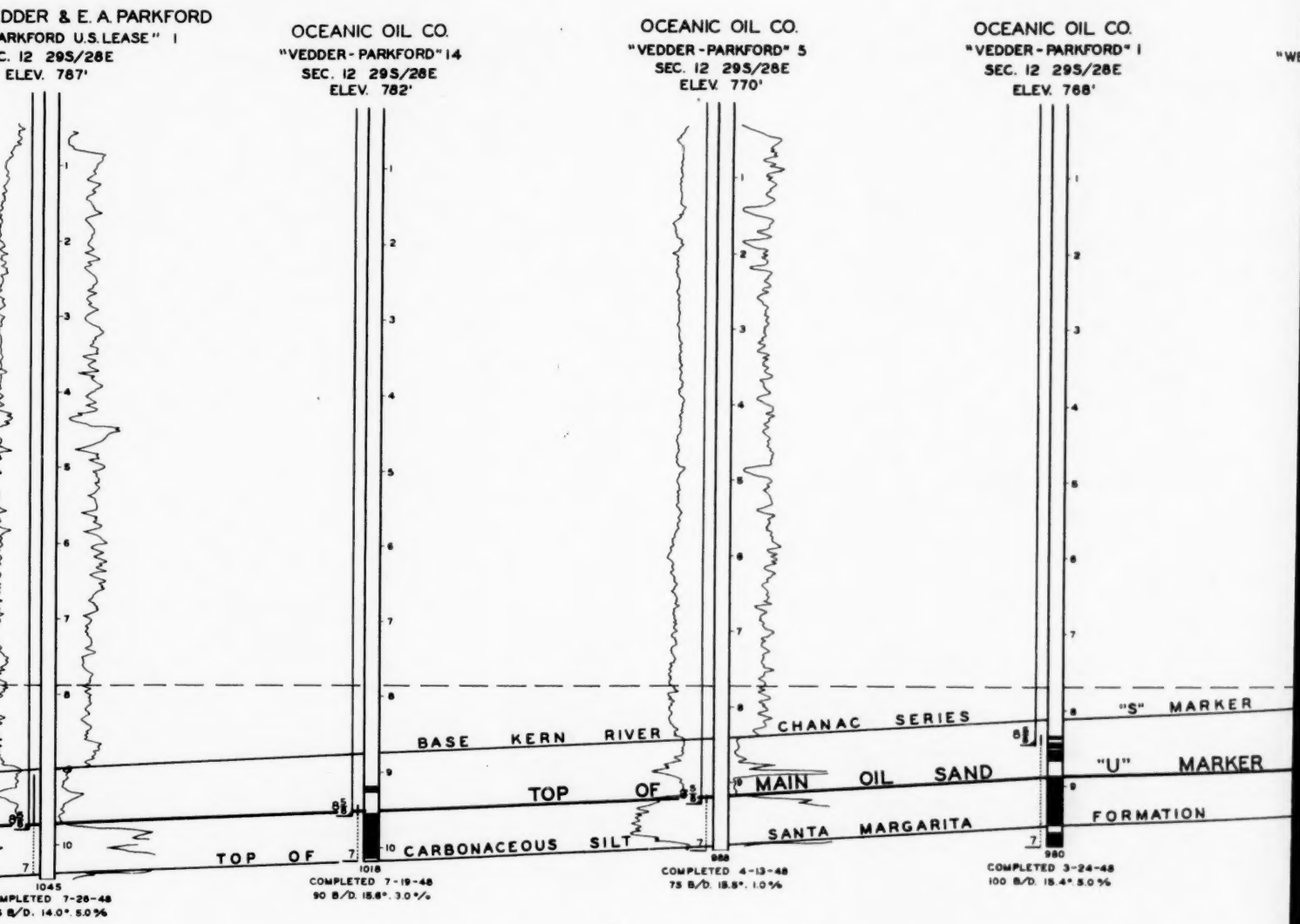
Datum - Sea Level
Contour interval 50 ft.
Field boundary

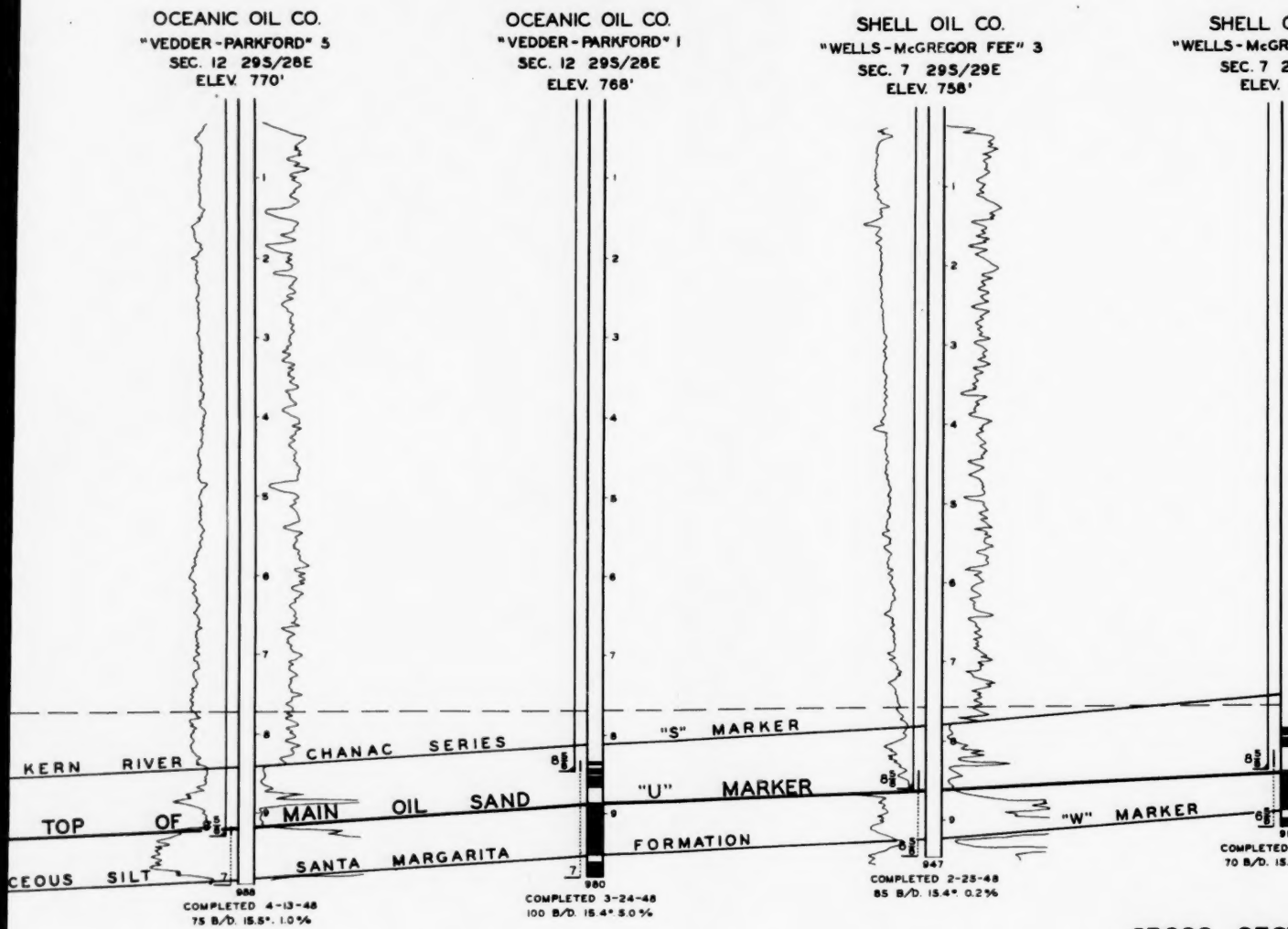


TYPICAL WELL LOG




SHELL OIL CO.
"ZIMMER-McGREGOR FEE" 1
SEC. 12 29S/28E
ELEV. 833'
DWIGHT G. VEDDER & E. A. PARKFORD
"VEDDER-PARKFORD U.S. LEASE" 3
SEC. 12 29S/28E
ELEV. 813'
DWIGHT G. VEDDER
& E. A. PARKFORD
"VEDDER-PARKFORD U.S. LEASE" 2
SEC. 12 29S/28E
ELEV. 798'
DWIGHT G. VEDDER &
"VEDDER-PARKFORD
SEC. 12 29
ELEV. 7
A
SEA LEVEL
1150
COMPLETED 8-29-48
83 B/D. 14.9°. 22.0%
1117
COMPLETED 7-26-48
85 B/D. 14.0°. 5%
1070
COMPLETED 8-17-48
60 B/D. 14.0°. 1.0%
COMPLETED
85 B/D. 14.


DDER & E. A. PARKFORD
ARKFORD U.S. LEASE" 1
C. 12 29S/28E
ELEV. 787'
1045
MPLETED 7-26-48
B/D. 14.0°. 5.0%
OCEANIC OIL CO.
"VEDDER - PARKFORD" 14
SEC. 12 29S/28E
ELEV. 782'
1018
COMPLETED 7-19-48
90 B/D. 15.8°. 3.0%
OCEANIC OIL CO.
"VEDDER - PARKFORD" 5
SEC. 12 29S/28E
ELEV. 770'
988
COMPLETED 4-13-48
75 B/D. 18.8°. 1.0%
OCEANIC OIL CO.
"VEDDER - PARKFORD" 1
SEC. 12 29S/28E
ELEV. 768'
980
COMPLETED 3-24-48
100 B/D. 15.4°. 5.0%
"WE
BASE KERN RIVER
TOP OF
CARBONACEOUS SILT
CHANAC SERIES
MAIN OIL SAND
SANTA MARGARITA
"S" MARKER
"U" MARKER
FORMATION



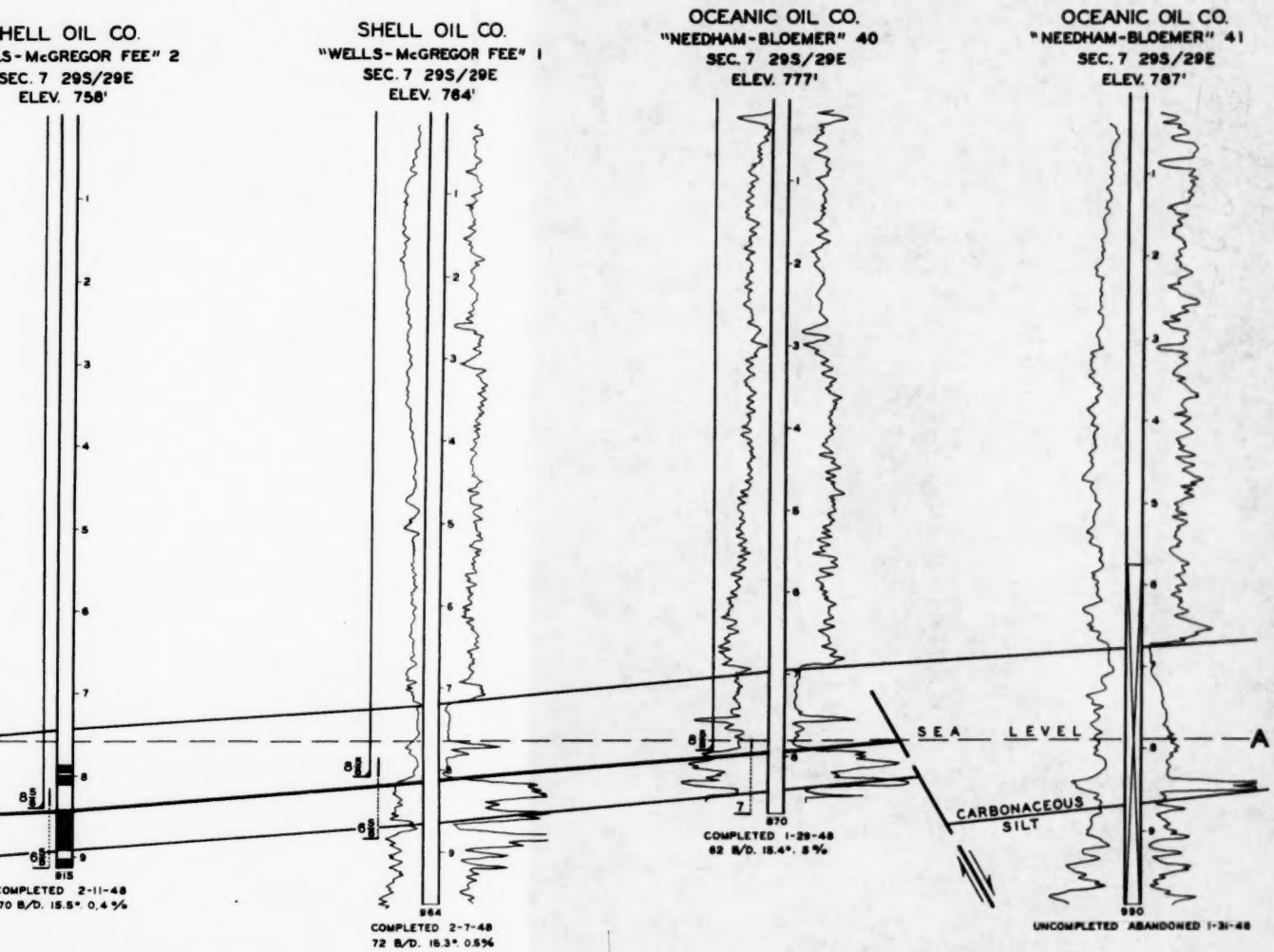
CROSS SEC

KERN BLUFF

ACCOMPANYING REPO

DIVISION OF
R. D. BUSH, STATE OIL

PLATE II



SECTION A-A

LUFF OIL FIELD

G REPORT BY C. H. CORWIN

ON OF OIL & GAS
TE OIL & GAS SUPERVISOR

SCALE
HORIZONTAL & VERTICAL
0 100 200 300 400 500

MAY 1950

FOR LOCATION SEE PLATE I

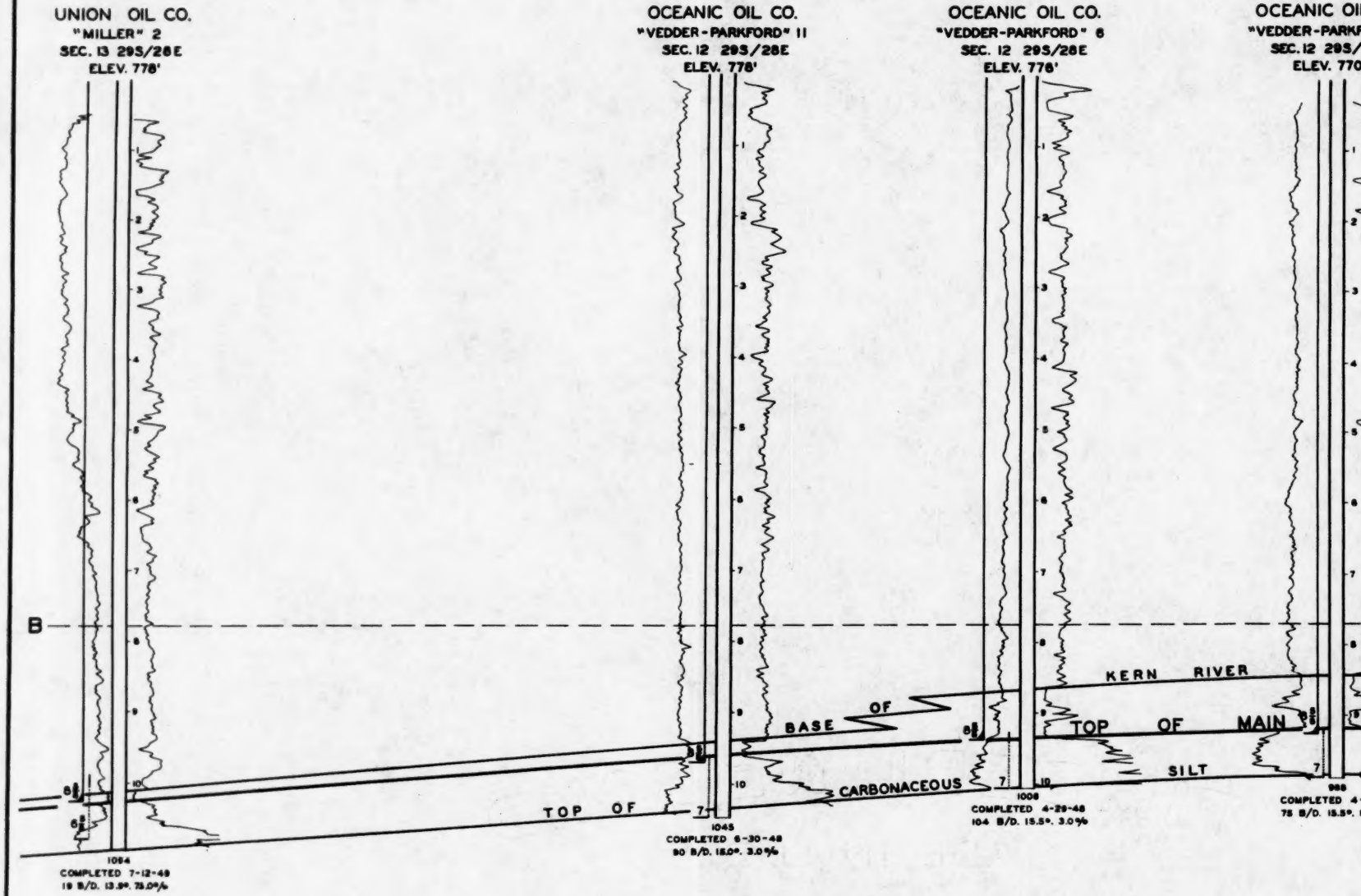
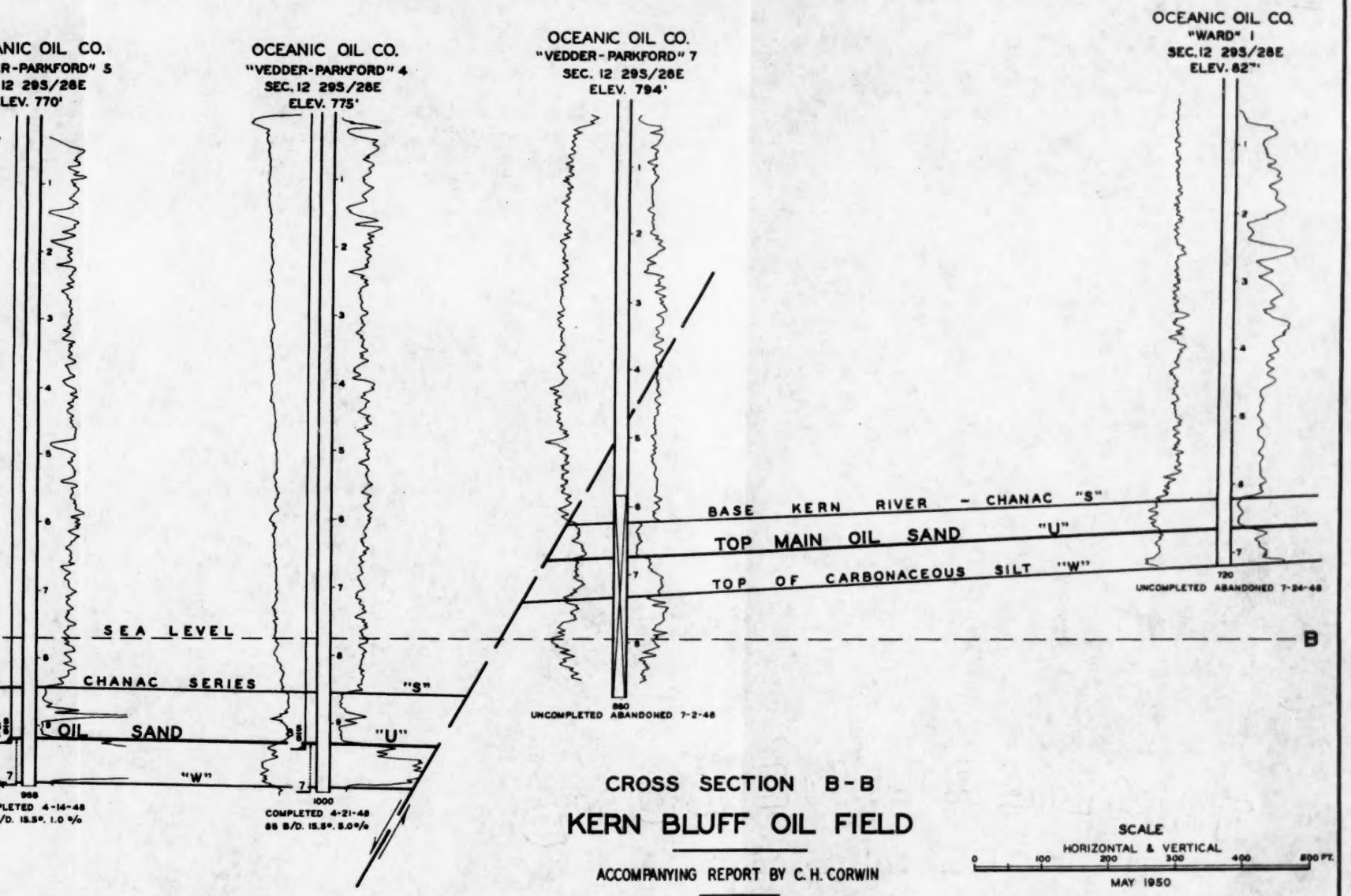

UNION OIL CO.
"MILLER" 2
SEC. 13 29S/28E
ELEV. 778'
OCEANIC OIL CO.
"VEDDER-PARKFORD" 11
SEC. 12 29S/28E
ELEV. 778'
OCEANIC OIL CO.
"VEDDER-PARKFORD" 6
SEC. 12 29S/28E
ELEV. 776'
OCEANIC OI
"VEDDER-PARK
SEC. 12 29S/
ELEV. 770
B
KERN RIVER
BASE OF
TOP OF MAIN
SILT
CARBONACEOUS
TOP OF
1084
COMPLETED 7-12-48
19 B/D. 13.9°. 75.0%
1045
COMPLETED 6-30-48
90 B/D. 18.0°. 3.0%
1008
COMPLETED 4-29-48
104 B/D. 15.5°. 3.0%
988
COMPLETED 4-
75 B/D. 15.5°.

PLATE III



CROSS SECTION B-B

KERN BLUFF OIL FIELD

SCALE
HORIZONTAL & VERTICAL
0 100 200 300 400 500 FT.

MAY 1950

ACCOMPANYING REPORT BY C. H. CORWIN

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

FOR LOCATION SEE PLATE I

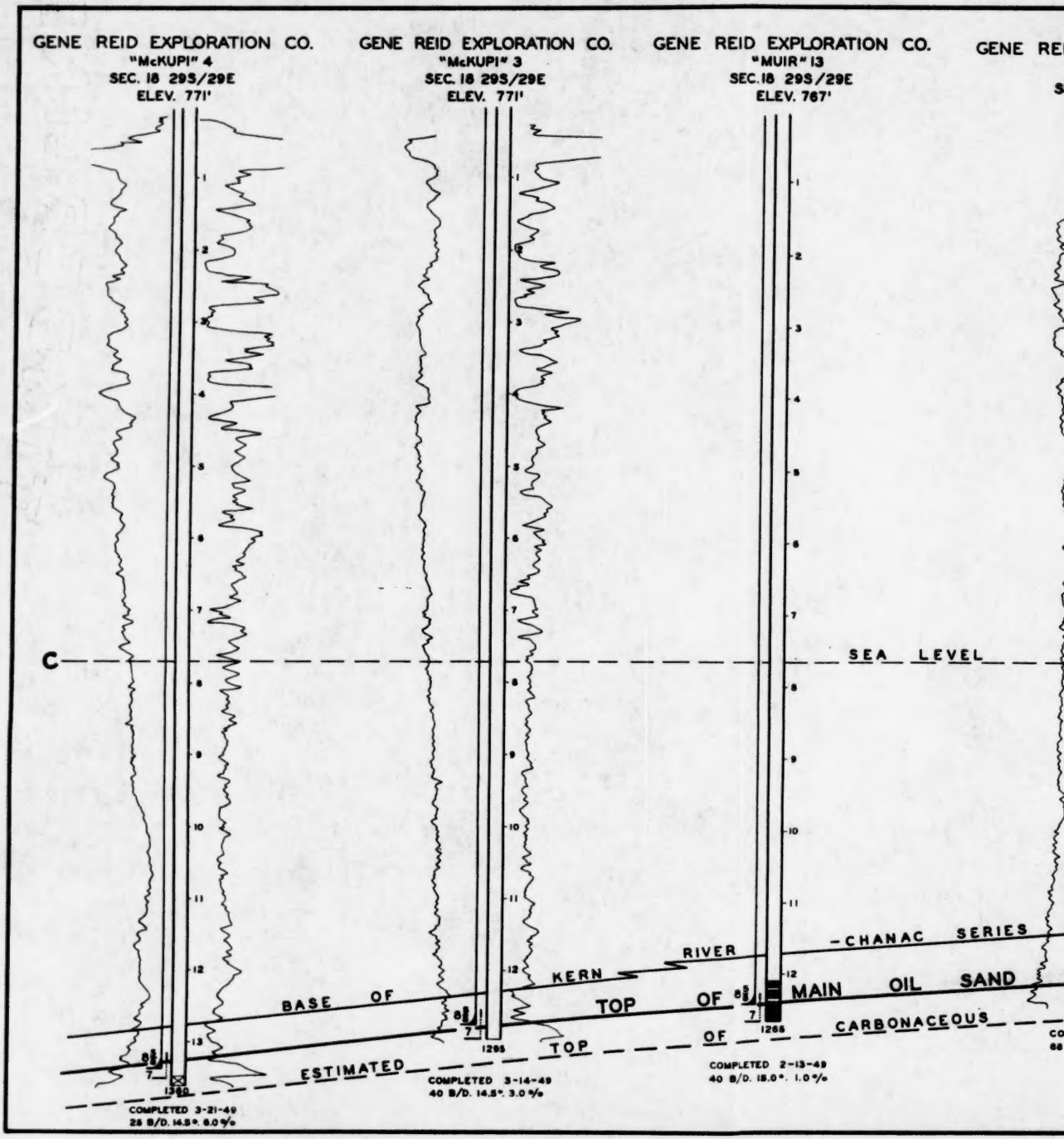
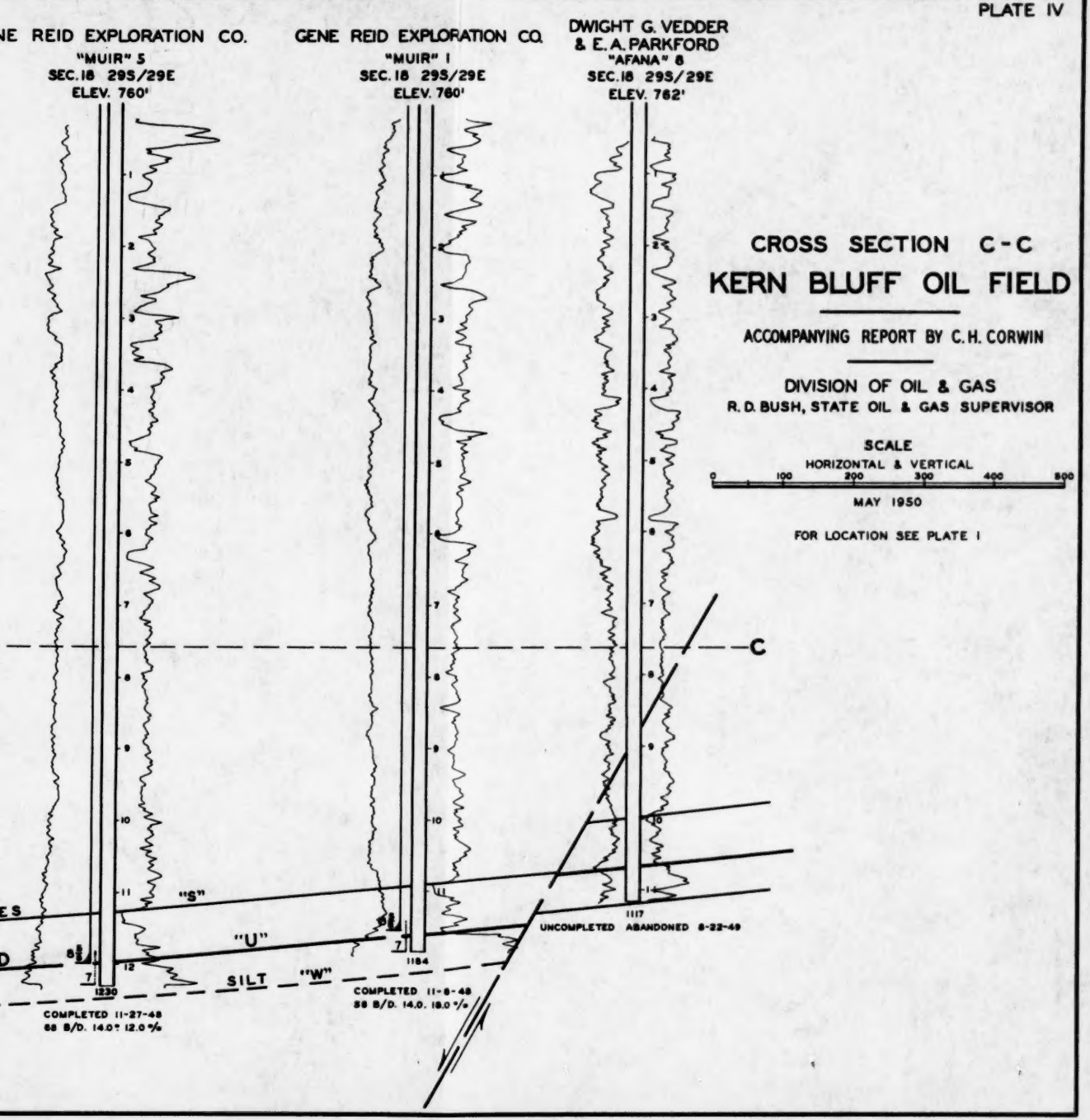

GENE REID EXPLORATION CO.
"McKUPI" 4
SEC. 18 29S/29E
ELEV. 771'
GENE REID EXPLORATION CO.
"McKUPI" 3
SEC. 18 29S/29E
ELEV. 771'
GENE REID EXPLORATION CO.
"MUIR" 13
SEC. 18 29S/29E
ELEV. 767'
GENE RE
C
SEA LEVEL
BASE OF KERN RIVER -CHANAC SERIES
TOP OF MAIN OIL SAND
TOP OF CARBONACEOUS
ESTIMATED
1360
COMPLETED 3-21-49
25 B/D. 14.5°. 8.0%
1295
COMPLETED 3-14-49
40 B/D. 14.5°. 3.0%
1285
COMPLETED 2-13-49
40 B/D. 15.0°. 1.0%

PLATE IV



CROSS SECTION C-C
KERN BLUFF OIL FIELD

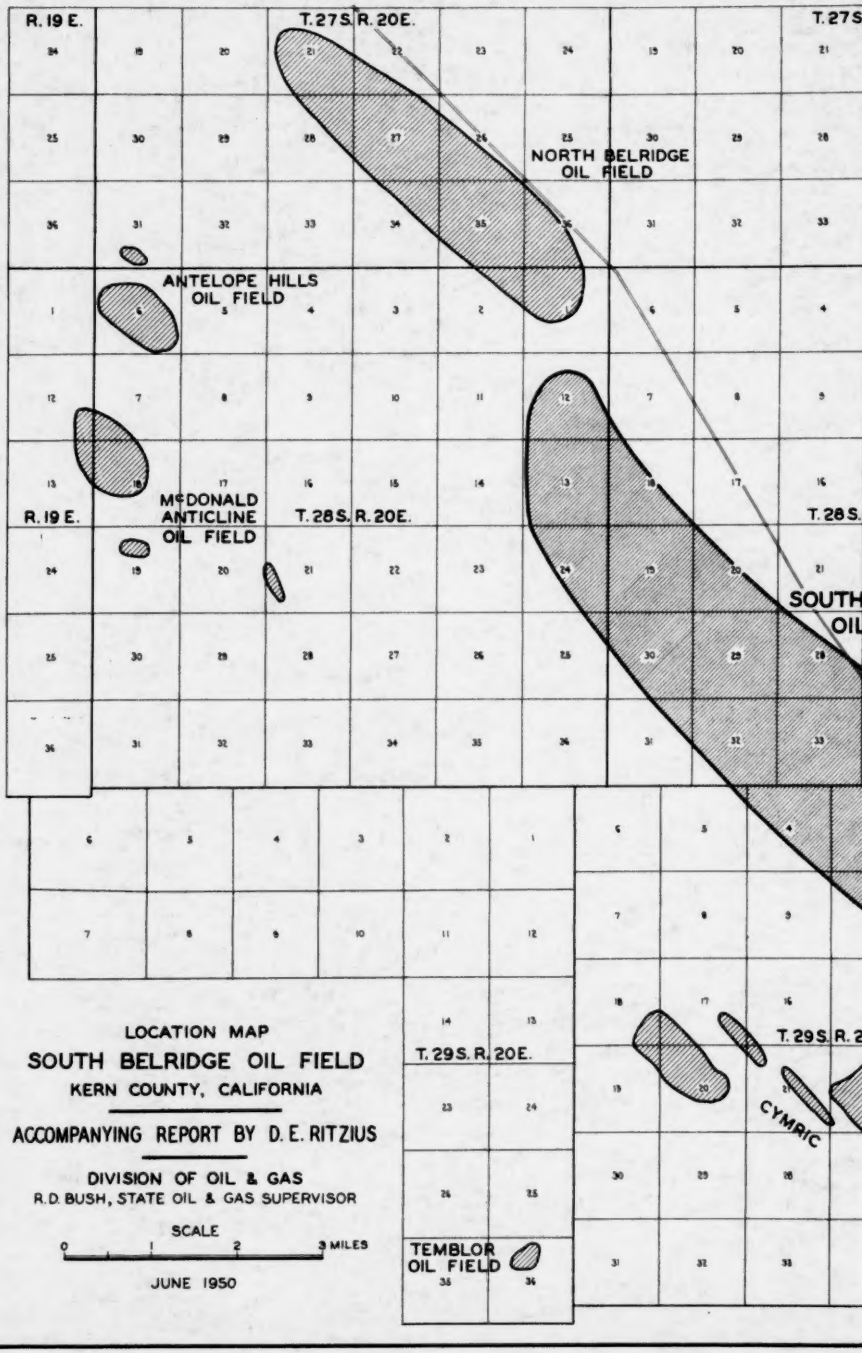
ACCOMPANYING REPORT BY C. H. CORWIN

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

SCALE
HORIZONTAL & VERTICAL
0 100 200 300 400 500

MAY 1950

FOR LOCATION SEE PLATE I



LOCATION MAP

SOUTH BELRIDGE OIL FIELD

KERN COUNTY, CALIFORNIA

ACCOMPANYING REPORT BY D. E. RITZIUS

DIVISION OF OIL & GAS

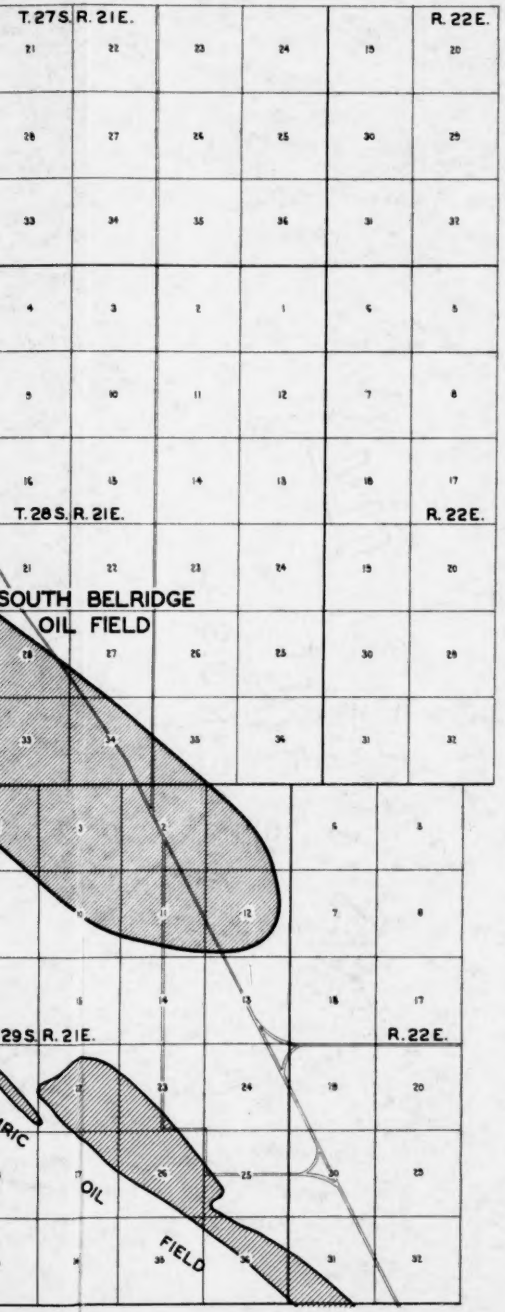
R. D. BUSH, STATE OIL & GAS SUPERVISOR

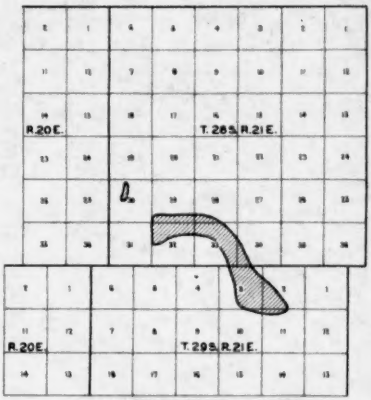
SCALE

0 1 2 3 MILES

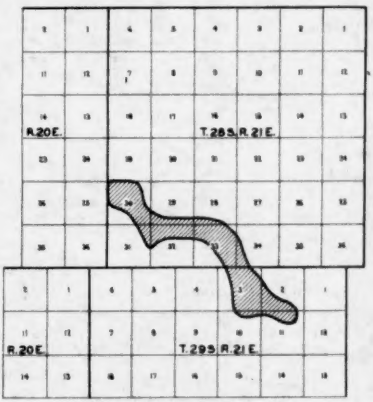
JUNE 1950

PLATE I

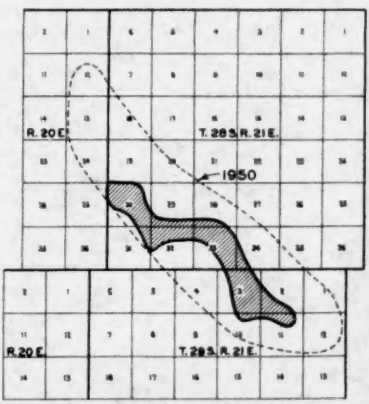




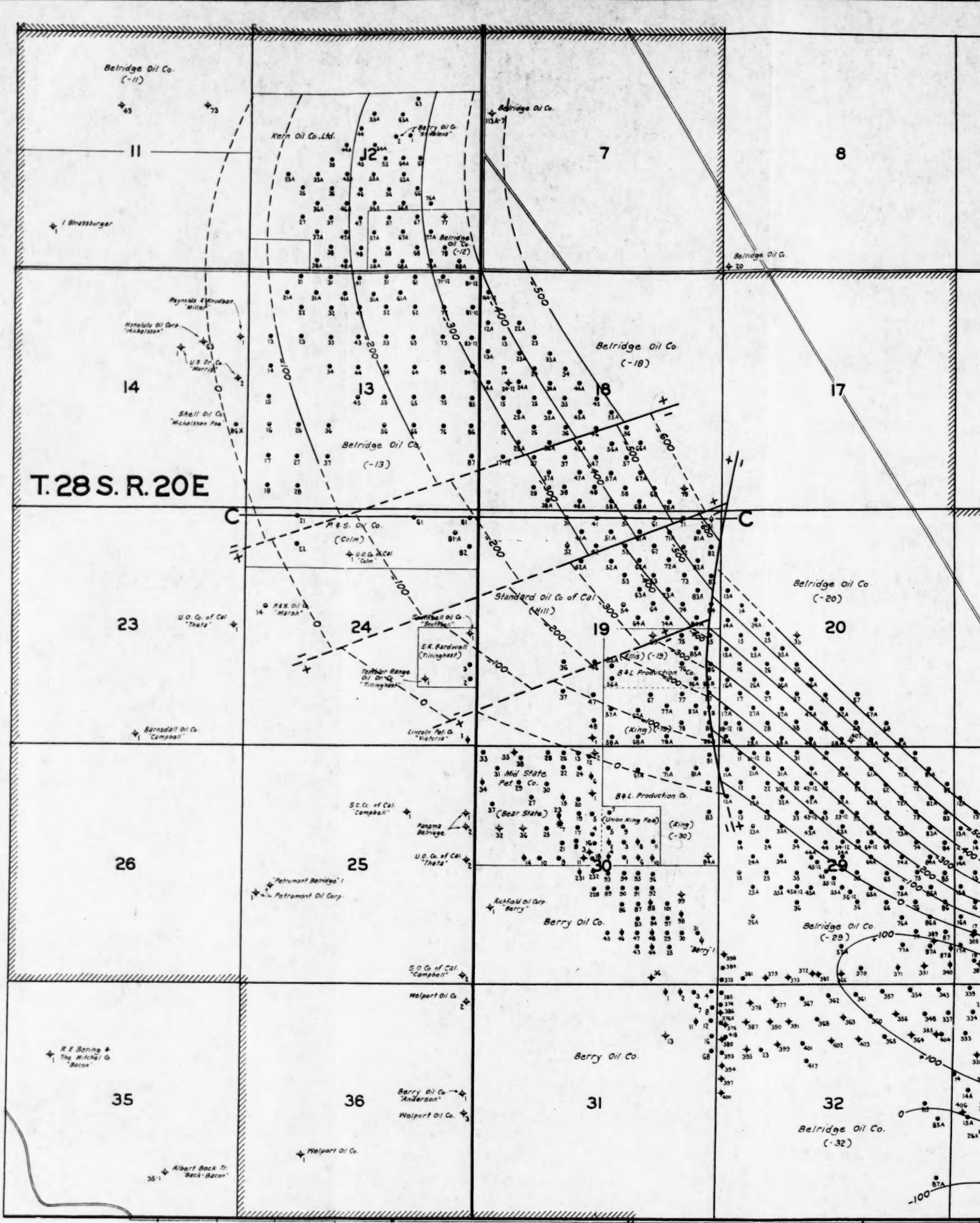
SOUTH BELRIDGE FIELD 1920



SOUTH BELRIDGE FIELD 1930



SOUTH BELRIDGE FIELD 1940



MAP OF
SOUTH BELRIDGE OIL FIELD
KERN COUNTY, CALIFORNIA
SHOWING CONTOURS ON
TOP OF LOWER TULARE OIL ZONE

ACCOMPANYING REPORT BY D. E. RITZIUS

DIVISION OF OIL & GAS

R. D. BUSH, STATE OIL & GAS SUPERVISOR

SCALE

2000 0 2000 4000 6000 FT.

JUNE 1950.

LEGEND

- Uncompleted drilling
- Uncompleted idle
- Uncompleted abandoned
- Completed producing
- Completed idle
- Completed abandoned
- Water
- Abandoned converted to water
- Gas
- Gas abandoned

Datum - Sea Level

Contour interval 100 ft.

Field boundary

9 | 10 | 11 | 12

16 | 15 | 14 | 13

T. 28 S. R. 21 E.

21 | 22 | 23 | 24

SOUTH BELRIDGE FIELD

28 | 27 | 26 | 25

33 | 34 | 35 | 36

4 | 3 | 2 | 1

9 | 10 | 11 | 12

T. 29 S. R. 21 E.

Belridge Oil Co. (-28)
Belridge Oil Co. (-27)
Belridge Oil Co. (-33)
Belridge Oil Co. (-34)
Belridge Oil Co. (-35)
C. H. Whittier (Belridge) (-3)
Ohio Oil Co. (Hopkins Fee)
Union Oil Co. of Cal. (Hopkins) (-4)
General Pet. Corp. (Marina) (-3)
General Pet. Corp. (Belridge) (-2)
General Pet. Corp. (Belridge) (-1)
Gen. Pet. Corp. (Belridge) (-1)
Shell Oil Co. (K.-K.)
General Pet. Corp. (Marina) (-10)
General Pet. Corp. (Belridge) (-11)
General Pet. Corp. (Belridge) (-12)
Union Oil Co. of Cal. (Hopkins) (-10)
Dorothy Taylor, Ltd.
Shell Oil Co. (K.-K.) (-12)
South Belridge Oil Co. (S.F.) (11-)
St. Claire
Reward
T.W.A.
Belridge
Killingsworth & Smith Operators (Arrington Fee)
G.P. Corp. "Pinehocker"
King George Oil Co.
Kahlenberg & Lyons "U.S."
B.A. Parkford "Sec. 12"
-200
-300
-400
-500
-600
A
A
B
B

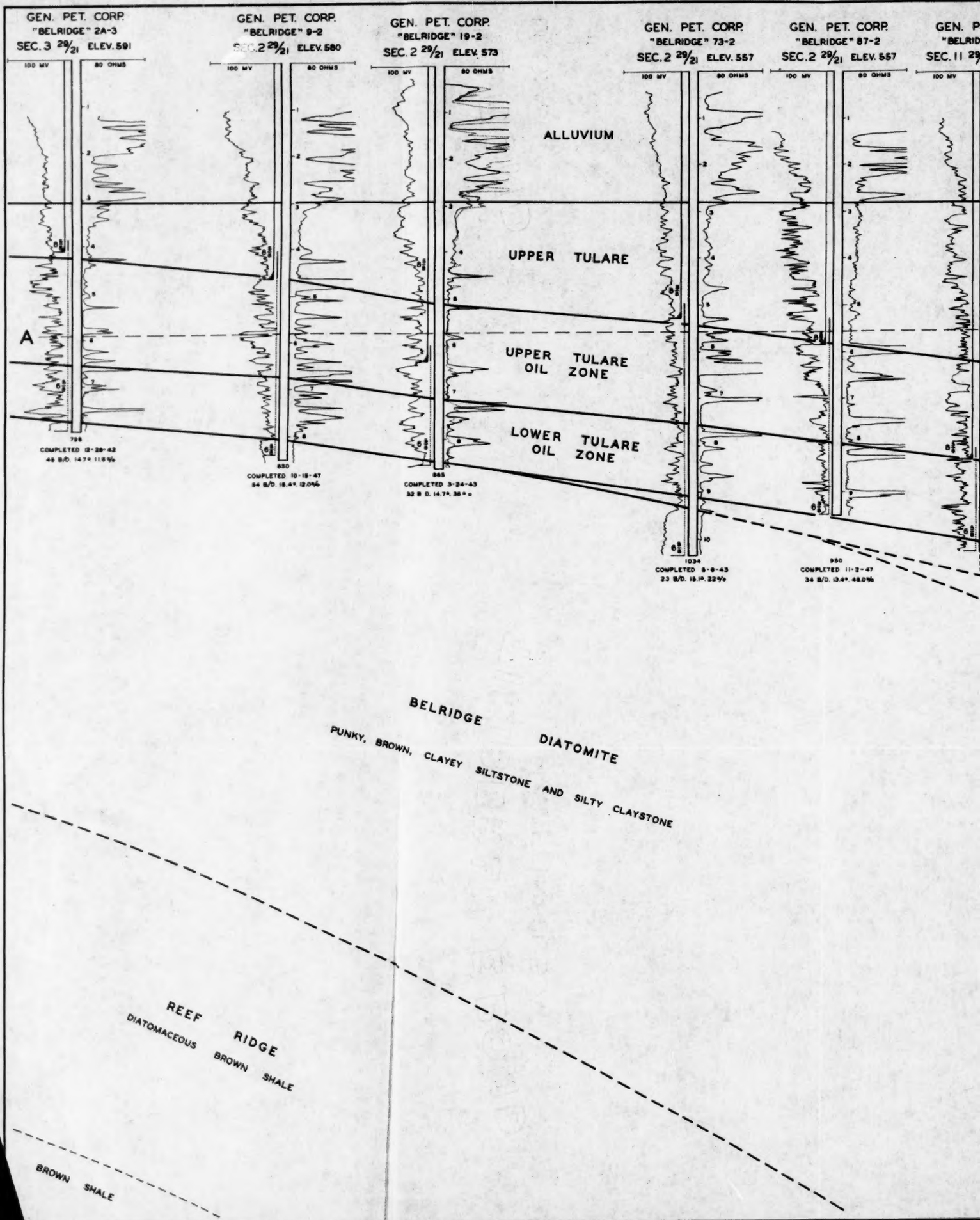
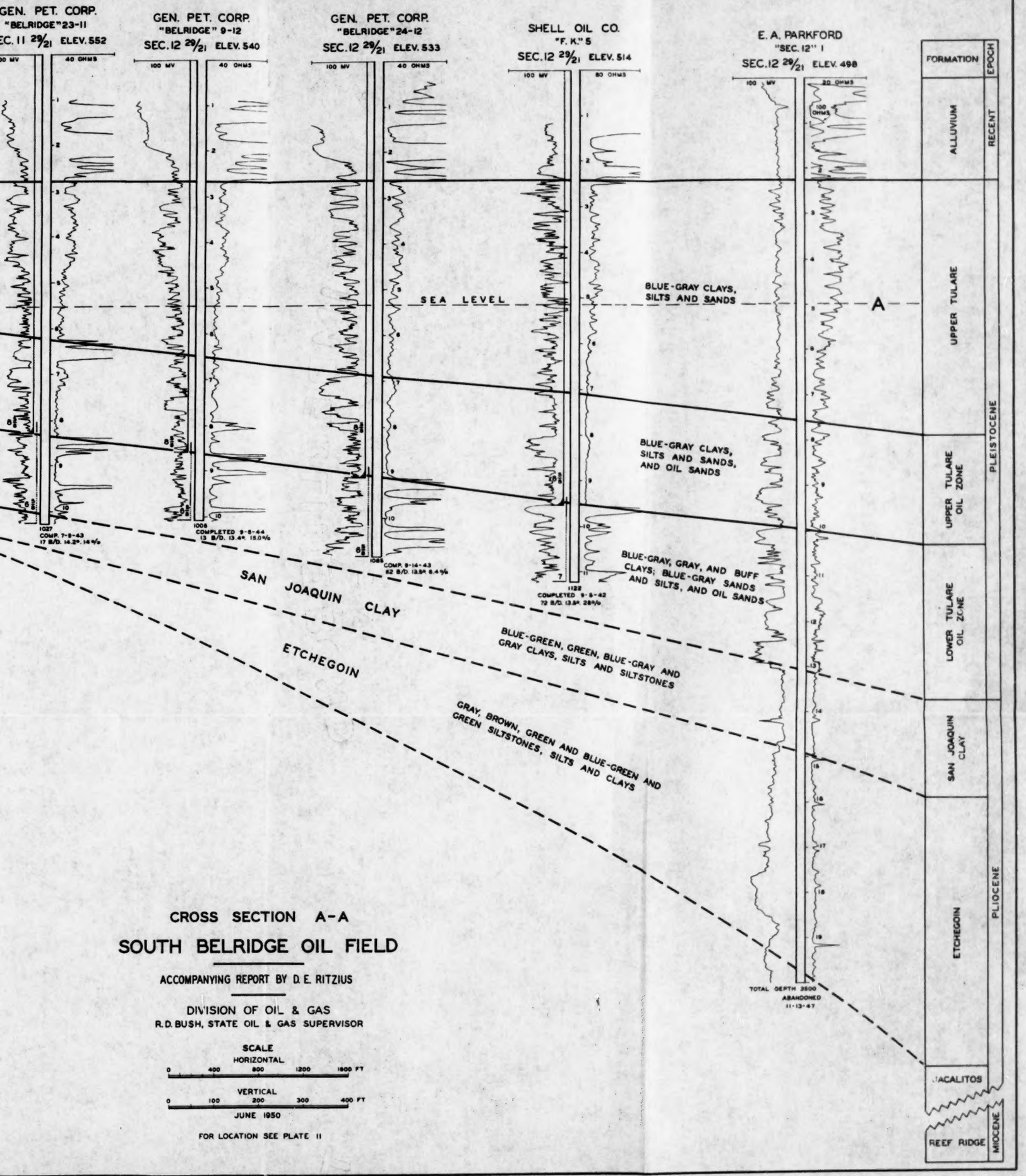

GEN. PET. CORP.
"BELRIDGE" 2A-3
SEC. 3 29/21 ELEV. 591
GEN. PET. CORP.
"BELRIDGE" 9-2
SEC. 2 29/21 ELEV. 580
GEN. PET. CORP.
"BELRIDGE" 19-2
SEC. 2 29/21 ELEV. 573
GEN. PET. CORP.
"BELRIDGE" 73-2
SEC. 2 29/21 ELEV. 557
GEN. PET. CORP.
"BELRIDGE" 87-2
SEC. 2 29/21 ELEV. 557
100 MV
80 OHMS
ALLUVIUM
UPPER TULARE
UPPER TULARE OIL ZONE
LOWER TULARE OIL ZONE
A
COMPLETED 12-28-42
48 B/D. 14.7°. 11.8%
COMPLETED 10-15-47
54 B/D. 18.4°. 12.0%
COMPLETED 3-24-43
32 B/D. 14.7°. 36°
COMPLETED 8-8-43
23 B/D. 18.1°. 22%
COMPLETED 11-2-47
34 B/D. 13.4°. 48.0%
BELRIDGE DIATOMITE
PUNKY, BROWN, CLAYEY SILTSTONE AND SILTY CLAYSTONE
REEF RIDGE
DIATOMACEOUS BROWN SHALE
BROWN SHALE

PLATE III



CROSS SECTION A-A

SOUTH BELRIDGE OIL FIELD

ACCOMPANYING REPORT BY D. E. RITZIUS

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

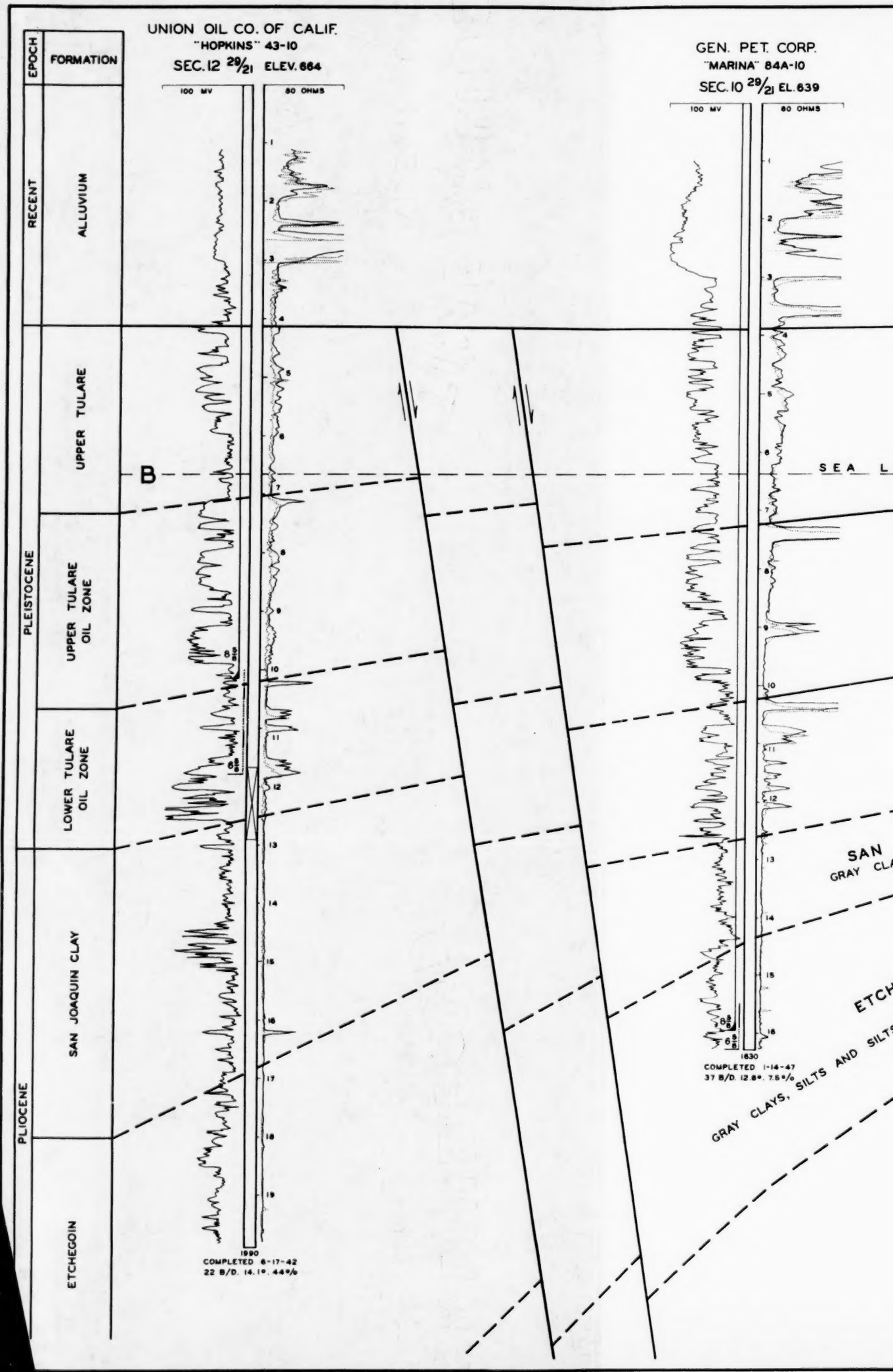
SCALE

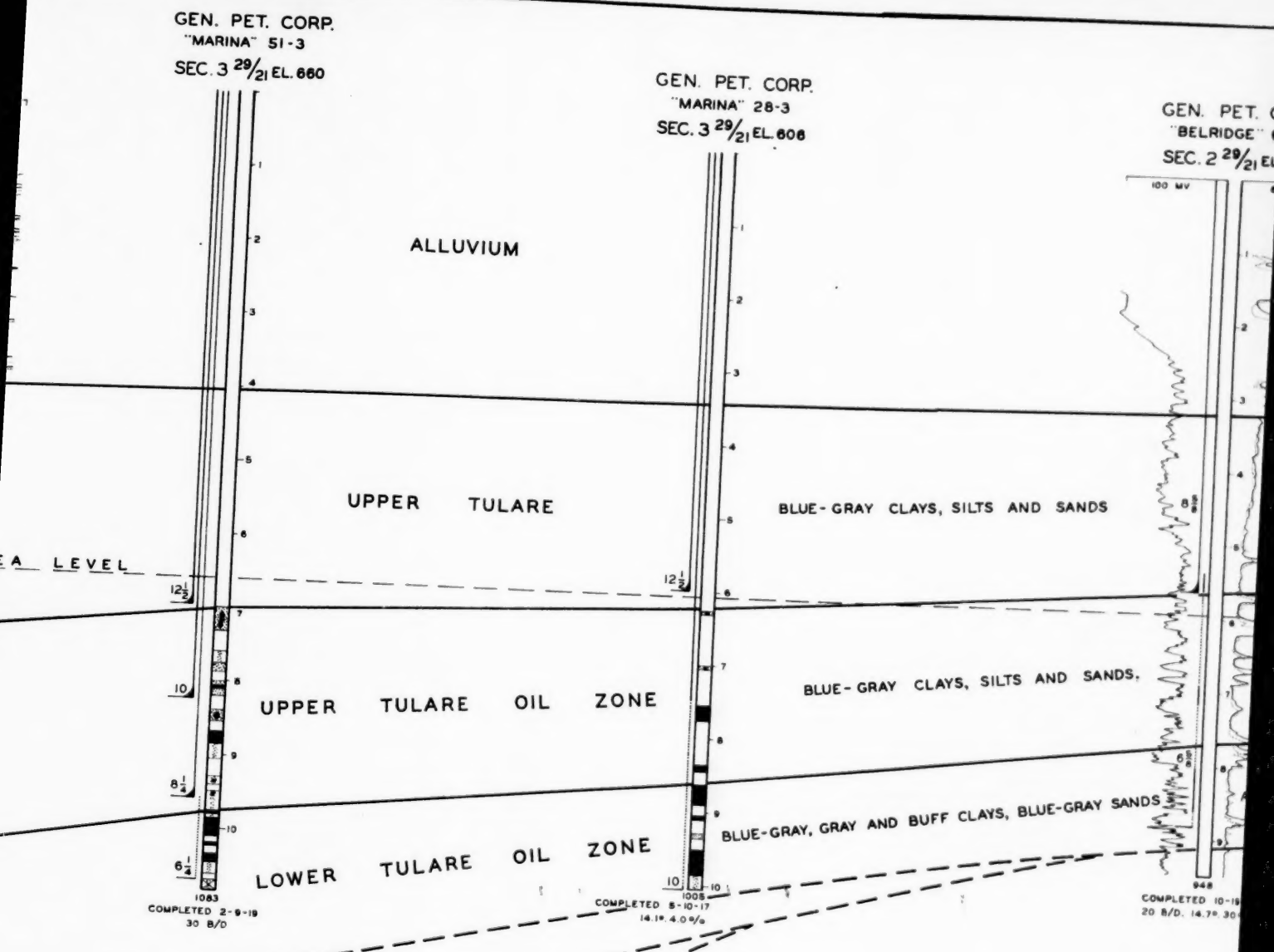
HORIZONTAL
0 400 800 1200 1600 FT

VERTICAL
0 100 200 300 400 FT

JUNE 1950

FOR LOCATION SEE PLATE II


EPOCH
FORMATION
RECENT
ALLUVIUM
PLEISTOCENE
UPPER TULARE
UPPER TULARE OIL ZONE
LOWER TULARE OIL ZONE
PLIOCENE
SAN JOAQUIN CLAY
ETCHEGOIN
UNION OIL CO. OF CALIF.
"HOPKINS" 43-10
SEC. 12 29/21 ELEV. 664
100 MV
80 OHMS
B
1990
COMPLETED 6-17-42
22 B/D. 14.1°. 44%
GEN. PET. CORP.
"MARINA" 84A-10
SEC. 10 29/21 EL. 639
100 MV
80 OHMS
SEA L
SAN
GRAY CLA
ETCH
1630
COMPLETED 1-14-47
37 B/D. 12.8°. 7.5%
GRAY CLAYS, SILTS AND SILTS



CROSS SECTION B-B
SOUTH BELRIDGE OIL FIELD

ACCOMPANYING REPORT BY D. E. RITZIUS

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

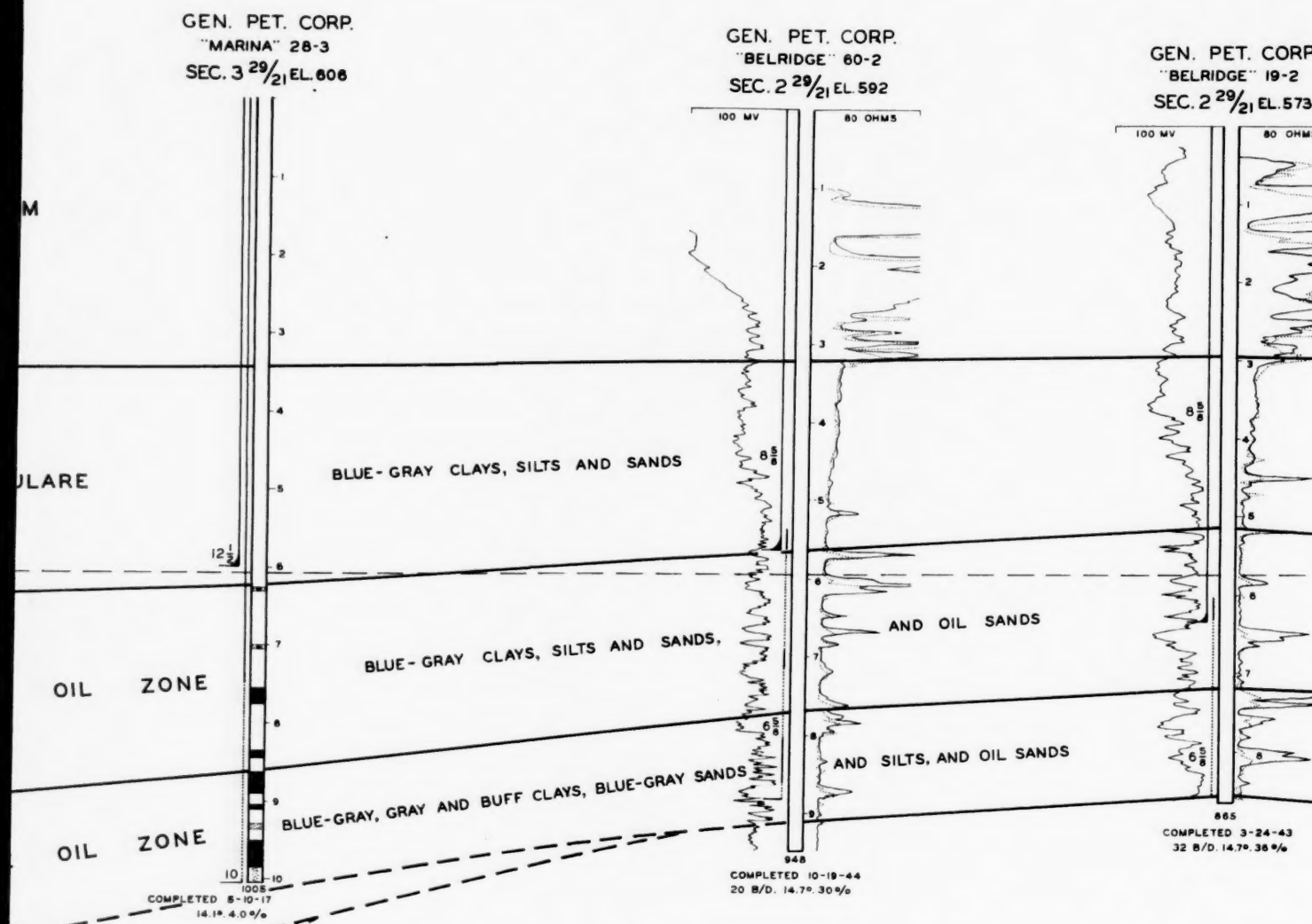
SCALE

HORIZONTAL
0 100 200 400 600 800 1000 FT

VERTICAL
0 100 200 300 400 500 FT

JUNE 1950

FOR LOCATION SEE PLATE II



BELRIDGE DIA

(PLIOCENE)

CROSS SECTION B-B
SOUTH BELRIDGE OIL FIELD

ACCOMPANYING REPORT BY D. E. RITZIUS

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

SCALE

HORIZONTAL
0 100 200 400 600 800 1000 FT

VERTICAL
0 100 200 300 400 500 FT

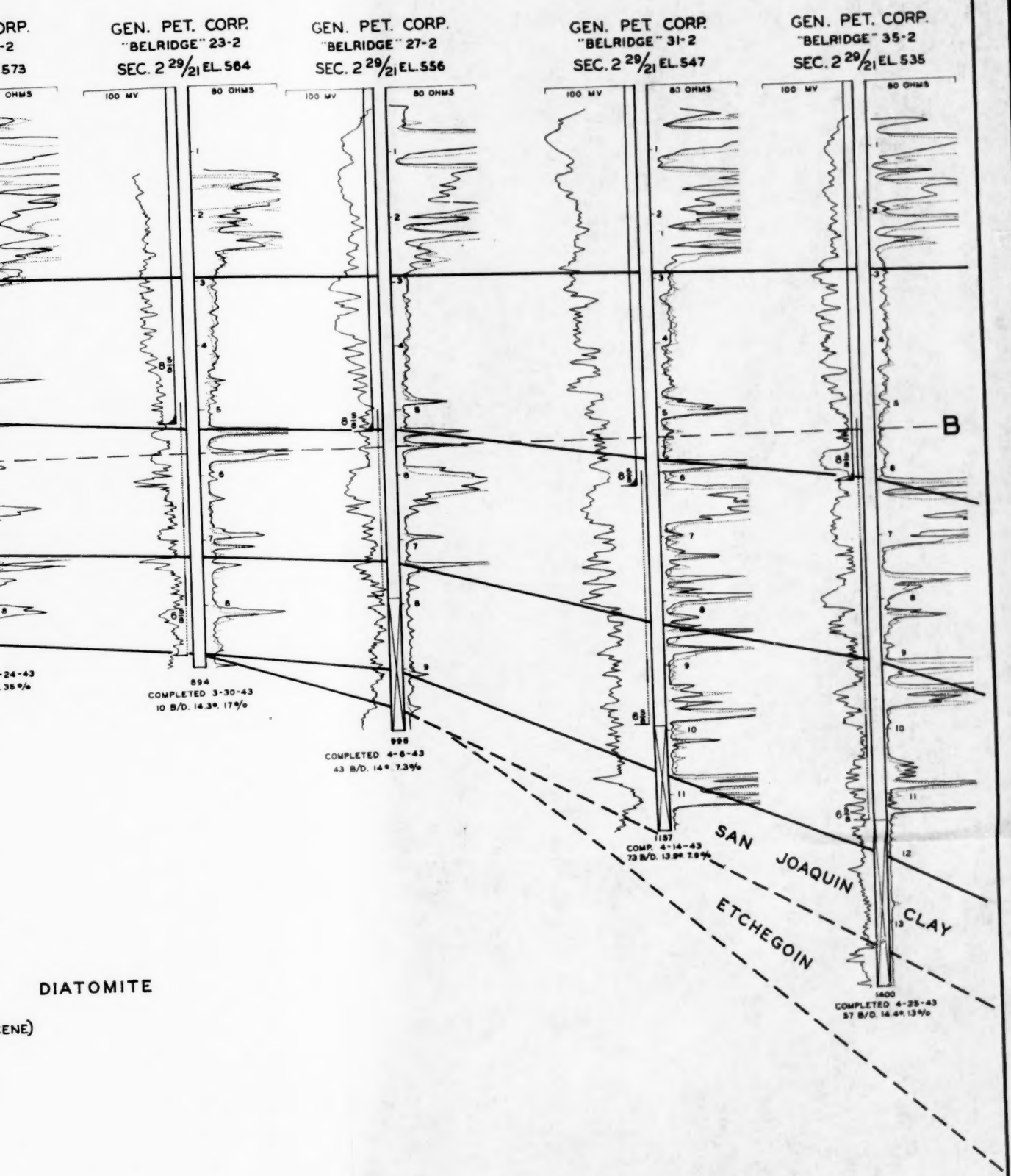
JUNE 1950

FOR LOCATION SEE PLATE II

REEF RIDGE

(MIOCENE)

PLATE IV

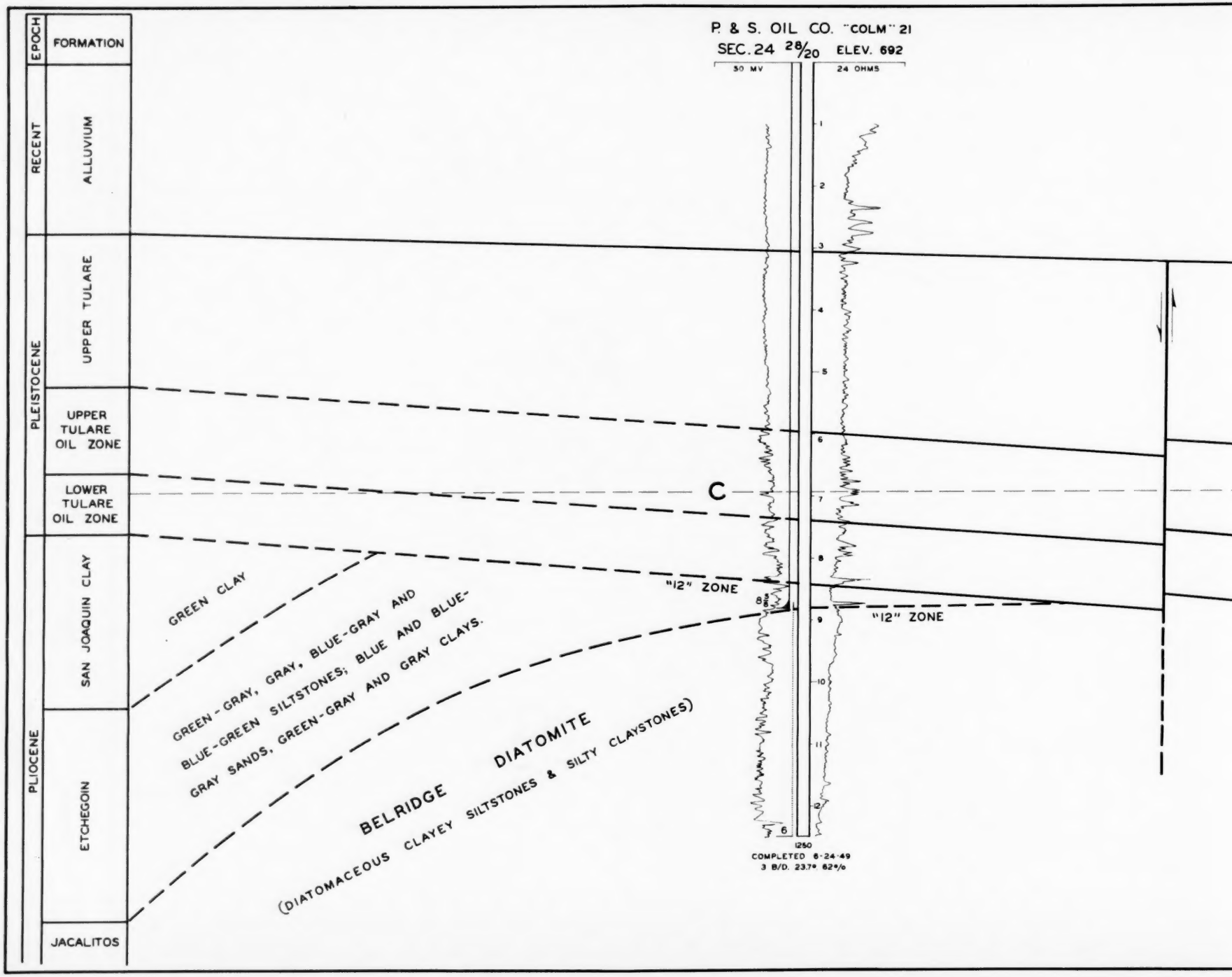


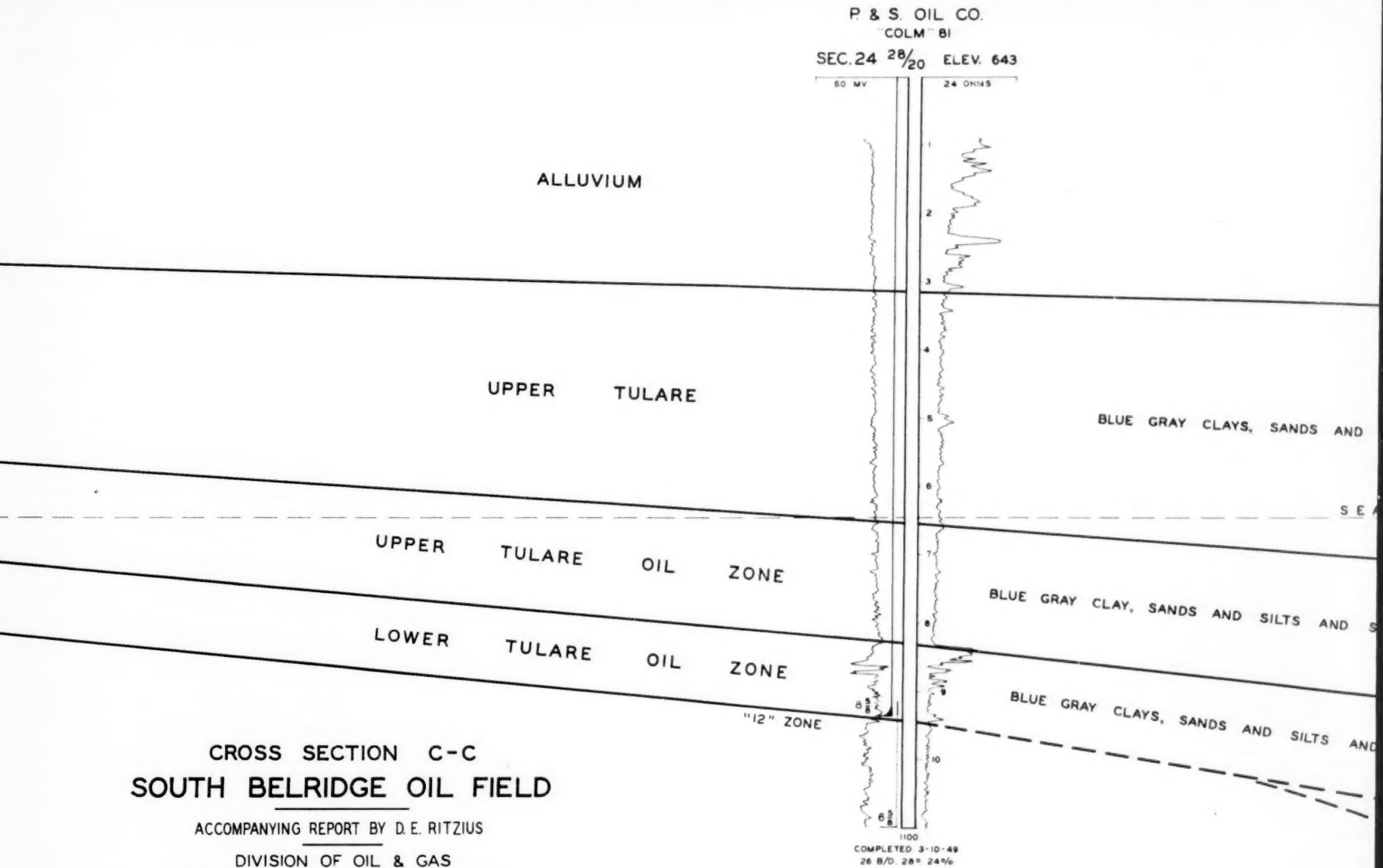
DIATOMITE

ENE)

RIDGE

CENE)


EPOCH
FORMATION
RECENT
ALLUVIUM
PLEISTOCENE
UPPER TULARE
UPPER TULARE OIL ZONE
LOWER TULARE OIL ZONE
SAN JOAQUIN CLAY
PLIOCENE
ETCHEGOIN
JACALITOS
GREEN CLAY
GREEN-GRAY, GRAY, BLUE-GRAY AND BLUE-GREEN SILTSTONES; BLUE AND BLUE-GRAY SANDS, GREEN-GRAY AND GRAY CLAYS.
BELRIDGE DIATOMITE
(DIATOMACEOUS CLAYEY SILTSTONES & SILTY CLAYSTONES)
C
"12" ZONE
"12" ZONE
P. & S. OIL CO. "COLM" 21
SEC. 24 28/20 ELEV. 692
50 MV
24 OHMS
1250
COMPLETED 8-24-49
3 B/D. 23.7° 62%



CROSS SECTION C-C
SOUTH BELRIDGE OIL FIELD

ACCOMPANYING REPORT BY D. E. RITZIUS

DIVISION OF OIL & GAS
R. D. BUSH, STATE OIL & GAS SUPERVISOR

SCALE

HORIZONTAL
0 200 400 600 800 FT

VERTICAL
0 100 200 300 400 FT

JUNE 1950

FOR LOCATION SEE PLATE II

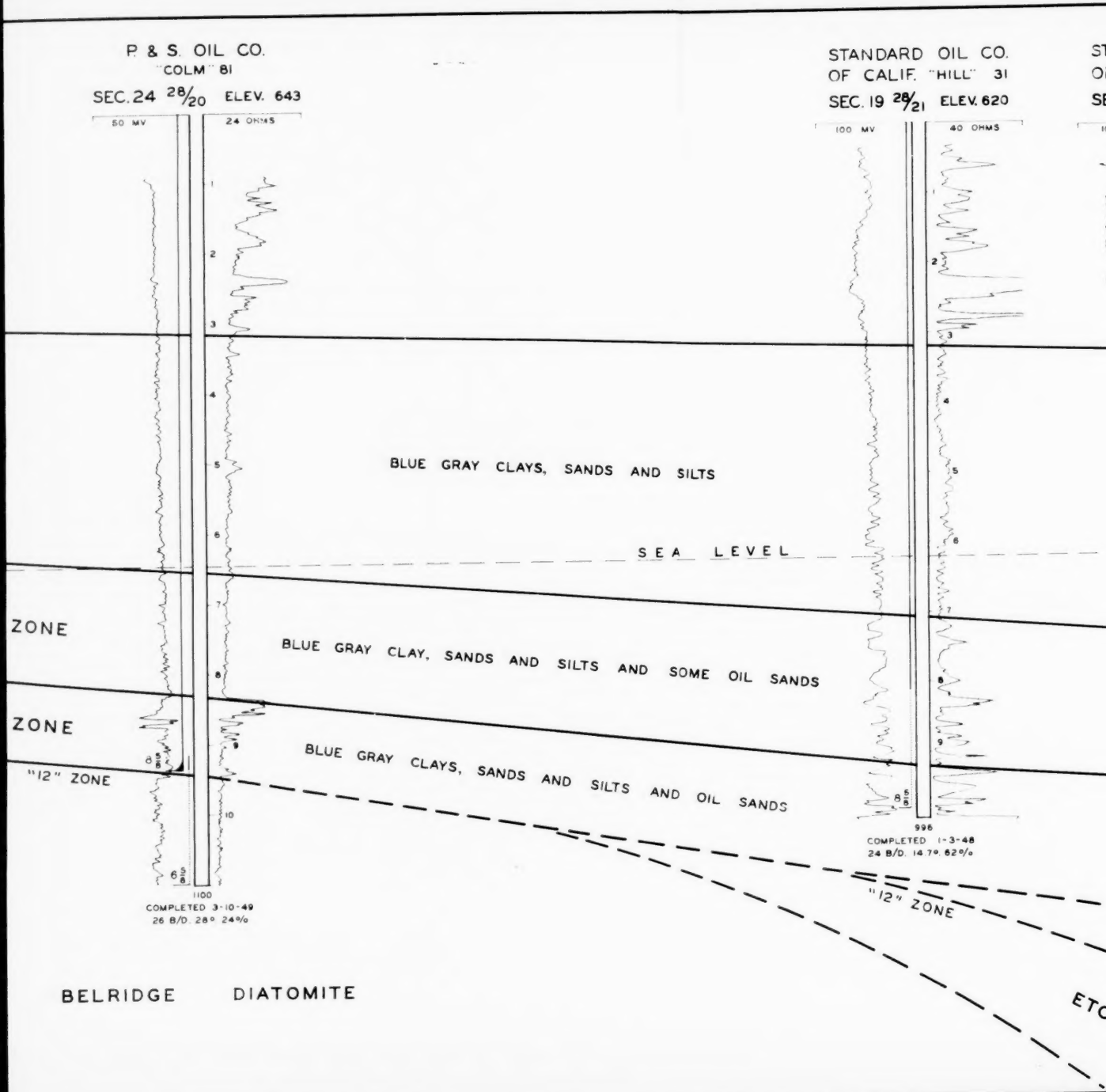
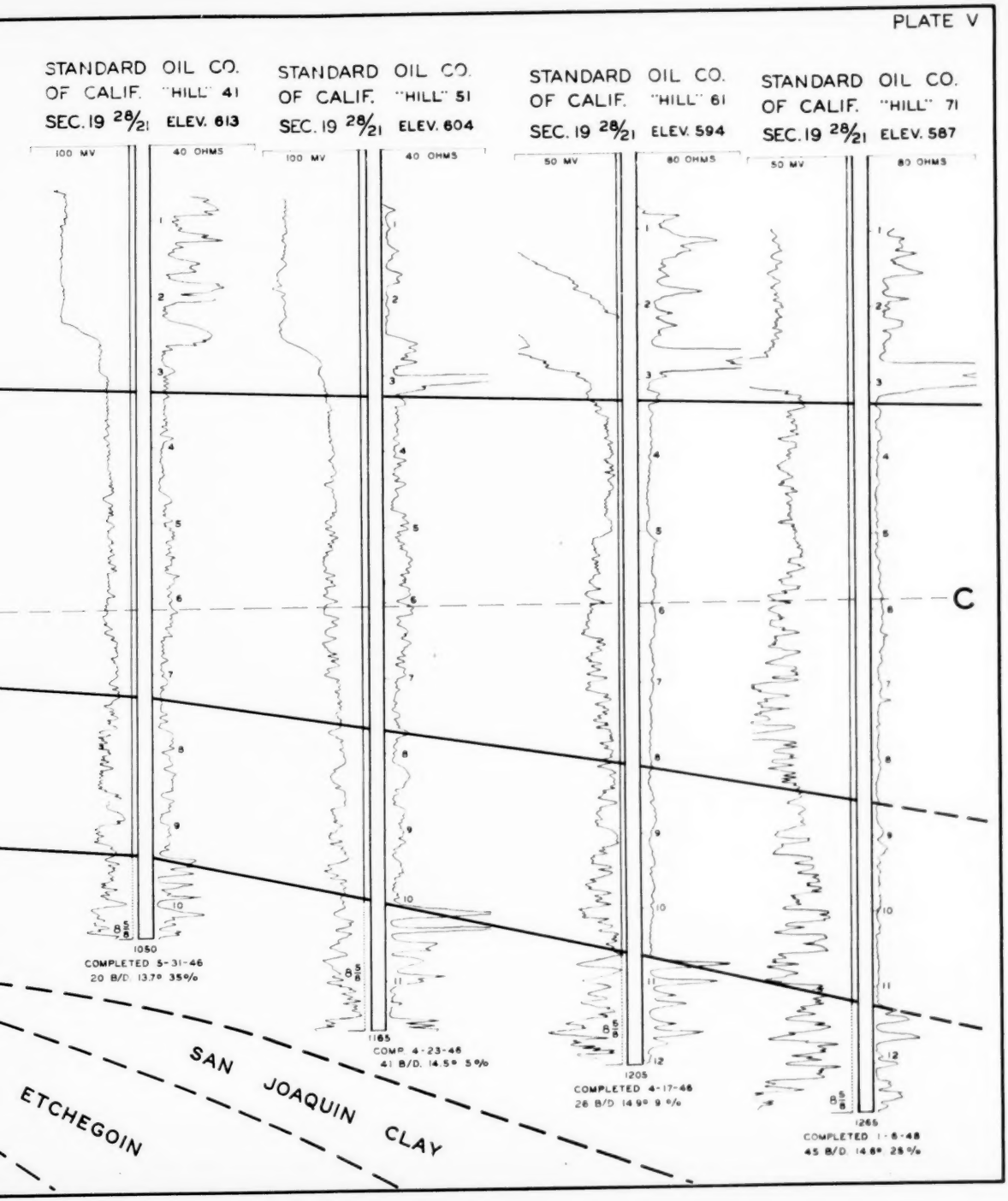

P. & S. OIL CO.
"COLM" 81
SEC. 24 28/20 ELEV. 643
50 MV
24 OHMS
STANDARD OIL CO.
OF CALIF. "HILL" 31
SEC. 19 28/21 ELEV. 620
100 MV
40 OHMS
BLUE GRAY CLAYS, SANDS AND SILTS
SEA LEVEL
ZONE
BLUE GRAY CLAY, SANDS AND SILTS AND SOME OIL SANDS
ZONE
BLUE GRAY CLAYS, SANDS AND SILTS AND OIL SANDS
"12" ZONE
8 5/8
6 5/8
1100
COMPLETED 3-10-49
26 B/D. 28°. 24%
996
COMPLETED 1-3-48
24 B/D. 14.7°. 62%
"12" ZONE
BELRIDGE DIATOMITE
ETC

PLATE V


STANDARD OIL CO. OF CALIF. "HILL" 41
SEC. 19 28/21 ELEV. 613
100 MV
40 OHMS
1050
COMPLETED 5-31-46
20 B/D 13.7° 35%
STANDARD OIL CO. OF CALIF. "HILL" 51
SEC. 19 28/21 ELEV. 604
100 MV
40 OHMS
1165
COMP. 4-23-46
41 B/D 14.5° 5%
STANDARD OIL CO. OF CALIF. "HILL" 61
SEC. 19 28/21 ELEV. 594
50 MV
80 OHMS
1205
COMPLETED 4-17-46
28 B/D 14.9° 9 %
STANDARD OIL CO. OF CALIF. "HILL" 71
SEC. 19 28/21 ELEV. 587
50 MV
80 OHMS
1265
COMPLETED 1-8-48
45 B/D 14.8° 25 %
C
SAN JOAQUIN CLAY
ETCHEGOIN

T. 29 S., R. 29 E. This well, which is approximately 1150 feet northeast of Shell Oil Company well No. "Afana" 1, was completed on September 10, 1947, with an initial yield of 80 barrels per day of 15.6-degree gravity oil. The production was obtained from the Transition and upper Santa Margarita formations between 815 and 935 feet. Further development was relatively rapid and the outline of the northern portion of the field was soon established. The area was officially designated as Kern Bluff field on January 1, 1948.

About one-half mile to the south of the discovery well, another fault block accumulation was discovered in November, 1948, by Gene Reid Exploration Company at well No. "Muir" 1, Section 18, T. 29 S., R. 29 E. Drilled to a total depth of 1148 feet, the well was completed on the pump for 56 barrels per day of 14.0-degree gravity oil. The production comes from formations between 1155 and 1184 feet.

STRATIGRAPHY

The following stratigraphic column shows the various formations encountered in the Kern Bluff field.

Age	Formation	Thickness	Lithology and remarks
Pliocene	Kern River—Chanac Undifferentiated	730'-1300'	Fresh water sands, gravels and clays. (Continental)
	Unconformity		
Upper Miocene	Transition Zone from Chanac-Santa Margarita	80'-150'	Greenish-gray claystone and coarse, greenish-gray sands containing pebbles and cobbles. Producing horizon in the Kern Bluff field.
	Santa Margarita Carbonaceous Silt	12'	Dull gray, very carbonaceous siltstone. (Marine)
	Santa Margarita Sands	600'±	Coarse gray sand grading to sandy, brown shale. Shell fragments and carbonaceous wood common. (Marine)
Middle Miocene	Round Mountain Silt	800'±	Dark brown shale with occasional thin sand streaks.
	Olcese Sand	650'±	Gray, silty sand with streaks of shale. (Marine and continental)
Lower Miocene	Freeman—Jewett Silt Undifferentiated	1400'±	Brown and gray siltstone
	Pyramid Hills Sand	120'±	Gray sand
	Upper Vedder Sand	90'	Medium to coarse gray sand.

As noted in the column above, the deepest penetration in the field has been to the Upper Vedder sand. From the records of wells that have been drilled to basement in the vicinity of the Kern Bluff field, it seems reasonable to assume an interval of about 1000 feet from the top of the Vedder sand to the basement complex.

STRUCTURE AND UNDERGROUND CONDITIONS

The structure of the Kern Bluff field is a southwesterly dipping, faulted homocline (Plate I). In both the northern and southern areas, production is limited on the north and east by normal faults and on the south and west by edge water. The east-west fault, which forms the northern limits of the field, is dipping approximately 60 degrees to the south

and has a displacement of about 260 feet (Plate III). Production is limited on the east in the northern area by one or more faults, the pattern of which is not fully understood at this time. In the southern area, production is obtained from a block, closed by a northwesterly-southeasterly trending fault, which dips to the southwest and has a displacement of 60 feet (Plate IV). Irregularities exist from well to well, due to the lenticular nature of the sediments. However, some of these irregularities may be due to faulting, which the writer has not shown, since they do not materially affect production. The presence of an unconformity at the base of the Kern River-Chanac series is indicated by the irregularity of its contact with the underlying Transition beds (Plates II and III).

The main producing formation throughout the field is the Transition zone, but those wells located high structurally in the northern fault block also obtain production from the uppermost part of the Santa Margarita formation. The producing sands in the northern part of the field are found from 740 to 1150 feet from the surface, and range in thickness from 80 feet in the structurally high wells to 30 feet in the lowest. The wells in the southern fault block produce from a 30-foot interval in the Transition zone, the top of which occurs from 1150 to 1350 feet from the surface.

TECHNOLOGY

Wells are drilled entirely by rotary tools, using portable drilling masts. Common drilling practice is to complete the well at or in the top few feet of the carbonaceous silt, which is a reliable marker throughout the area. In general, the producing horizon is cored and electrical logs are made. The casing program consists of setting an 8⅝″ water string and completing with a 6⅝″ or 7″ liner. Tests for water shut-off are generally made through gun perforations above the producing zone. Wells are drilled exclusively with jel mud, which is displaced with oil after the liner is set.

PRODUCTION

Production from the Kern Bluff field has had a fairly rapid decline. This may be attributed in part to the large number of pebbles and cobbles present in the zone, which materially reduces the reservoir capacity. One hundred and thirty-one wells have been drilled in the field; of this number, 112 were completed to production and 19 abandoned. Total production of the field to January 1, 1950, was 1,349,770 barrels of oil with a negligible amount of gas.

May, 1950

SOUTH BELRIDGE OIL FIELD

By D. E. Ritzius *

The South Belridge oil field is located in Kern County on the western side of the southern San Joaquin Valley, approximately 40 miles west of Bakersfield and 10 miles north of McKittrick. Its location in relation to neighboring oil fields is illustrated on Plate I.

The South Belridge field is one of the earliest producing areas of the State. During and immediately after the war years, it experienced a greatly intensified development and expansion because of the increased demand for low gravity oils.

REGIONAL TOPOGRAPHY

The local area is one of relatively flat topography although a slight rise in elevation can be noted upon approaching the field. The desert vegetation that characterizes the area extends into the Temblor Range, approximately five miles to the west. The field roughly parallels the range as do most of the fields on the west side of the San Joaquin Valley. To the east, flat desert characteristics predominate until the cultivated lands of the Buttonwillow district are reached.

HISTORY OF DEVELOPMENT

The discovery well of the South Belridge oil field was Belridge Oil Company No. 101, Sec. 33, T. 28 S., R. 21 E., M. D. B. & M., completed from a depth of 782 feet in April 1911, with an initial production of 100 barrels per day of 25.3-degree gravity oil. The development campaign following this discovery lasted about three years and resulted in the drilling of approximately 100 wells, the center of this activity being slightly south of the common corner of Sections 29, 28, 32, and 33, T. 28 S., R. 21 E. Following three years of minor development, another active drilling period began, and approximately one hundred wells were drilled in the following two-year interval. The majority of these wells were drilled in the eastern part of Sec. 3 and the western part of Sec. 2, T. 29 S., R. 21 E.

With the exception of the drilling of approximately sixty wells during the years 1927, 1928, and 1929, in Sec. 30, T. 28 S., R. 21 E., few wells were drilled and very little additional acreage was added to the field from 1920 to 1942. Renewed development of the field began during 1942 and carried through 1949, the total number of wells being increased by more than four times and the productive acreage increased by more than three times, extending the field almost five miles to the northwest and one mile to the southeast. The rate of development is illustrated on the bottom of Plate I where the field boundaries are drawn at evenly spaced intervals in the history of the field.

RELATION TO NORTH BELRIDGE FIELD

The predominant structural characteristics of the North and South Belridge oil fields are en echelon anticlinal folds trending northwest-southeast. In the North Belridge field the fold is quite well delineated, but

* Assistant Oil and Gas Engineer, Division of Oil and Gas.

in the South Belridge field structural conditions below the Pliocene are not well known.

The two fields are very unlike as to age of producing formations and gravity of oil produced. Production from North Belridge field is largely from Miocene formations with some Oligocene contributing, the gravity of the oil ranging from 30 to 60 degrees. However, a very small amount of 14-degree gravity oil is produced from the Pleistocene.

In contrast, the production from South Belridge field is mostly from the Pleistocene and is 12- to 15-degree gravity oil. Considerable 18- to 28-degree gravity oil is produced from the Pliocene and upper Miocene, but this does not constitute a large portion of the field total. At the present time the distanee between the two fields is less than one mile.

STRUCTURAL CONDITIONS AND CHARACTER OF THE FORMATIONS

The general structural character of the South Belridge field is one of sharp anticlinal folding in the Miocene, overlain by less steeply folded Pliocene and gently folded Pleistocene strata. However, in the structurally high areas of the field, the sequence of strata above the Miocene differs greatly over short distances because of unconformities.

The existence of four apparent unconformities above the top of the Miocene indicates that the area was subject to quite frequent movement after Miocene time. Two of these unconformities—the one at the base of the Tulare and the one at the base of the Jacalitos—appear to be of major proportions. The other two are much less evident and their existence is open to question. In fact, if there is an error in differentiating between San Joaquin Clay and Etchegoin in critical locations, much evidence would be lost for considering the existence of an unconformity between the two formations; but if the differentiations are correct, the San Joaquin Clay in places lies directly upon the Jacalitos, as shown in the cross sections on Plate III and Plate IV. The unconformity between the Etchegoin and the Jacalitos appears to be of the least magnitude of all, and evidence of its existence is not conclusive.

Due to the unconformity at the base of the Tulare, this formation, in the structurally high areas of the field, rests directly upon the Jacalitos, the San Joaquin Clay and Etchegoin being completely eroded away. The cross sections on Plate III, Plate IV, and Plate V illustrate this condition and also illustrate the position on the flanks of the fold where the San Joaquin Clay and Etchegoin strata are present. Also because of this unconformity, the Tulare formation north of Sec. 33, T. 28 S., R. 21 E., does not dip with the westerly flank of the fold but continues to rise to the west, as shown in cross section C-C, Plate V.

The highest position on the flanks of the structure where the San Joaquin Clay or Etchegoin are present cannot always be determined with exactness, in the absence of diagnostic fossils, owing to the similarity in lithology of the Tulare, San Joaquin Clay, and Etchegoin formations. This similarity exists even though the Tulare and San Joaquin Clay are fresh or brackish water deposits and the Etchegoin is marine.

Over most of the field, the Tulare formation consists of blue-gray clays, sands and silts, and black oil sands; but in certain areas green-gray, brown, tan, gray, and buff clays are also found. The San Joaquin

Clay formation consists predominantly of green and green-gray clays, sands and silts over most of the structure, but in certain areas the green and greenish casts are gone and all of the strata are gray. In the relatively few locations on the structure where wells have penetrated into the Etchegoin, a wide variation in color in different localities is also found to exist. Only gray clays, sands, and siltstones, some of which are diatomaceous, are found in some areas, while green and green-gray clays; green, green-gray, blue-green, and blue-gray siltstones; and blue-gray sands are characteristic of other areas. Thus, it is readily seen why distinguishing between these formations is sometimes difficult. The differentiation usually is made, however, on a combination of texture, color, and any fossils present.

The Belridge Diatomite formation is very readily distinguished, being a punky, light brown, diatomaceous, clayey siltstone or silty claystone, with a very strong gasoline odor. It has quite a bluish cast when wet, most of which is lost when dry.

The attitude of the Miocene strata is not well established in all areas because of the unconformity at the base of the Pliocene and because few wells have penetrated into the Miocene over the field as a whole.

In addition to a number of wells in Sec. 33, T. 28 S., R. 21 E., which produce from the fractured shales of the Reef Ridge and McLure formations of the upper Miocene, six wells in other parts of the field have been drilled into the Miocene in search of production. Two of these wells, however, are outside the present producing limits of the field. Only one of the six, Belridge Oil Company well No. 62W-33, Sec. 33, T. 28 S., R. 21 E., was drilled through the Miocene into the Oligocene. The formations penetrated by this well, the most favorably located of the deep tests, are listed below.

Well No. 62W-33

FORMATIONS PENETRATED

Epoch	Formation	Thickness	
Recent	Alluvium	250	250
Pleistocene	Tulare	406	406
Lower Pliocene	Jacalitos	884	884
Upper Miocene	Reef Ridge	180	
	McLure	2680	
	Antelope	1260	5660
	McDonald	1540	
Middle Miocene	Devilwater	630	
	Gould	2020	2650
Lower Miocene	Media	690	
	Carneros	1190	
	Upper Santos	340	
	Agua	137	3940
	Lower Santos	477	
	Upper Phacoides	232	
	Intermediate Shale	30	
	Lower Phacoides	379	
	Salt Creek	465	
Oligocene	Tumey	127	
	Oceanic	180	314
	Tumey	7	
	Total Depth—14,104 feet		

PRODUCING ZONES

Tulare

The major portion of the production from the South Belridge field is from sands in the Tulare formation. These oil sands are unconsolidated, usually poorly sorted, ranging from silt to quite large grains, and, when well saturated, black in color. The oil produced from this horizon ranges in gravity from 12 to 15 degrees.

Two producing zones can readily be distinguished, the lower zone being productive over the larger area; and for this reason, the contours shown on Plate II were drawn on the top of the lower zone. The faults affecting production are also shown on Plate II, all other faults being omitted.

The upper oil zone is productive only south of the curved fault shown through Sec. 19, T. 28 S., R. 21 E., and only above approximately the 350-foot contour shown on Plate II. There are some minor exceptions: the wells in the fault block marked "A" in the vicinity of the section line between Sec. 18 and Sec. 19, T. 28 S., R. 21 E., are productive in the upper zone above the 350-foot contour; also, the upper zone is not productive at the extreme southeast end of the field, below the approximate 275-foot to 300-foot contour shown on Plate II.

The lower zone is productive over the entire developed area of the field with the exception of the structurally high locations in Sec. 12, 13, and 24, T. 28 S., R. 20 E., in which areas the sands gradually become siltier and more clayey until their remnants are noncommercial. This is illustrated in cross section C-C, Plate V. Actually, to a lesser degree, this same condition exists over the entire field north of Sec. 33, T. 28 S., R. 21 E., where, in progressing up dip in the Tulare, the sands gradually thin out until they finally almost disappear at about the westerly productive limits of the field in the southwest corner of T. 28 S., R. 21 E.

The upper producing zone ranges in thickness from over 300 feet in favorable areas on the flank to less than 200 feet in high positions on the structure. The percentage of oil sand within this zone varies from very high in favorable areas on the flank to very low in certain areas high on the structure. These conditions will be observed in the cross sections on Plate III and Plate IV.

The lower producing zone has a maximum thickness of approximately 300 feet in the most favorable areas on the flanks and less than 50 feet in certain structurally high locations. The oil sands constitute approximately one-half the zone over much of the field; however, quite wide variations to this occur in certain structurally high localities, as portions in the center of the field where almost the entire 50 feet of zone is oil sand, and as in the extreme north end of the field where almost the entire zone is silt and clay.

Both zones are produced together over much of the field, as is illustrated by many of the wells in the cross sections on Plate III and Plate IV.

Initial completions of wells producing from the Tulare zones range from 20 barrels per day to 150 barrels per day of 12- to 15-degree gravity oil. The production decline is quite rapid for the first few weeks, after which it is extremely slow. Many wells drilled in the early days of the field are still producing small amounts of oil.

Etchegoin

Only two areas are found in which production is obtained from the Etchegoin formation; one is discussed under the "12" zone, and the other is in Sec. 10, T. 29 S., R. 21 E., where five wells produce 12- to 14-degree gravity oil from a small stringer of Etchegoin sand some distance above the Jacalitos. One of these wells, General Petroleum Corporation "Marina" 84A-10, is included in the cross section B-B, Plate IV, where the stratigraphic relationship of this sand is illustrated.

"12" Zone

The "12" zone, with minor exceptions, is the top 50 to 200 feet of the Belridge Diatomite (Jacalitos). The production from this zone comes from sandy silt and silt stringers in the diatomite. Since these stringers are apparently small, erratic lenses, their thickness, frequency, and the depth at which they will be present at a given location is difficult to determine. The presence or absence of these stringers accounts for the great differences in production of "12" zone wells.

The "12" zone is not always produced individually. Practically all of the wells in Sec. 30, 31, and 32, and many in Sec. 19, 20, and 29, T. 28 S., R. 21 E., produce from a few basal Tulare sands and the "12" zone combined. Also, some of the wells drilled when the field was first discovered, which are high on the structure and which ordinarily are considered to be Tulare zone wells, actually penetrated the diatomite and secured either part or practically all of their production from the diatomite. This is best illustrated by General Petroleum Corporation well No. "Belridge" 13-3, Sec. 3, T. 29 S., R. 21 E., which was completed in 1912 from a depth of 868 feet and still is producing over 100 barrels per day of 25-degree gravity oil. Obviously all of this oil has not been produced from the Tulare formation.

Many wells, however, are open to production from the "12" zone only. These include all of the wells in Sec. 12, T. 28 S., R. 20 E., most of the wells in Sec. 13 and 24, T. 28 S., R. 20 E., and some of the wells in Sec. 18, T. 28 S., R. 21 E.

Wells completed from the "12" zone in the recent development period range in production from 5 barrels per day to 100 barrels per day of 20- to 28-degree gravity oil.

The exceptions mentioned previously, regarding the age of the producing zone, are certain small areas such as the western part of Sec. 30, T. 28 S., R. 21 E., where it is possible that the "12" zone may be partially of San Joaquin Clay age, and parts of Sec. 12, 13, and 24, T. 28 S., R. 20 E., and much of Sec. 18, T. 28 S., R. 21 E., where it appears that part, and in cases all, of the "12" zone is Etchegoin in age. This situation exists because the top of the "12" zone begins at the base of the Tulare; so, depending upon structural position, the "12" zone may be composed of San Joaquin Clay, or Etchegoin, or Jacalitos, or a combination of the three. Cross section C-C, Plate V, illustrates this condition.

Brown Shale

A number of wells in Sec. 33, T. 28 S., R. 21 E., and a few wells in neighboring sections, produce from the fractured brown shale. These wells are open to the formation over quite a long interval, including most of the Belridge Diatomite, all of the Reef Ridge, and the top few hundred feet of the McLure shale. The oil produced from this fractured

brown shale ranges in gravity from 28 to 32 degrees, and wells completed in it range in production from 28 to 115 barrels per day. The depth of these wells, averaging 3000 feet, is dependent upon the amount of fractures in the shale and character of fluid present.

Possible Deeper Zones

To date there has been no oil produced from Miocene sands in the South Belridge field. However, the two deep wells drilled high on the structure, General Petroleum Corporation (now Berry Oil Company) well No. "Berry" 1, in Sec. 30, and Belridge Oil Company well No. 62W-33, Sec. 33, T. 28 S., R. 21 E., both cored oil-stained sand in the Miocene. In view of these encouraging indications, it seems probable that more wells will be drilled in search of deep producing zones some time in the future.

DRILLING AND COMPLETION PRACTICES

Drilling and completion practices for Tulare zone wells in the South Belridge field have followed more or less along two established patterns. The most common procedure is to run an 8⅝-inch combination string, with perforations on bottom, and cement through a basket above the oil zone with enough cement to reach to the surface. The other frequently used method is to cement an 8⅝-inch water string above the oil zone, wall scrape the producing zone, using oil as the circulating medium, and hang a 6⅝-inch perforated liner. Perforations are usually either 80 or 100 mesh slots. A few Tulare zone wells have been gravel packed, but to date gravel packing has not been adopted as a standard practice.

No such definite procedures have been followed in the drilling and completion of the "12" zone wells. Water strings of from 7 to 9 inches, with suitable liners, have been used in some wells, while others have utilized 7- to 8⅝-inch combination strings. However, the present trend appears to follow the common method of cementing 8⅝-inch water string and hanging a 6⅝-inch liner.

Wells to be completed in the fractured brown shale follow a uniform procedure. After cementing approximately 100 feet of surface casing, the well is drilled ahead and the formation tested at chosen intervals until the desired total depth is reached. Then a 7-inch combination string is run, with usually a quite long perforated interval on bottom, and cemented through perforations at three points approximately as follows: through the basket immediately above the perforated interval, through a cementing collar slightly below the base of the Tulare formation, and through a cementing collar at the top of the Upper Tulare oil zone.

STATISTICS

During 1945 the field production was at its highest, the field producing 4,628,480 barrels of oil for the year. This was an average of 18.6 barrels of oil per well per producing day.

Although the drilling of many "12" zone wells caused the field to be quite active during 1949, practically all of the Tulare zone wells were shut in near the end of the year because of the decreased demand for low gravity oil.

The total number of wells capable of production has steadily increased until the number now approximates 1100; however, since 1946 the number being produced has gradually decreased to about 300 in December 1949.

The South Belridge field is more drastically affected by oversupply than most oil fields in the State because it is predominantly a low-gravity oil field. For this reason, the number of wells produced will very likely remain low until market conditions have improved.

As of January 1, 1950, the South Belridge field has produced 47,514,403 barrels of oil and is credited with a proved acreage of 7010 acres as of that date.

June, 1950

PRODUCTION STATISTICS OF CALIFORNIA OIL FIELDS

The accompanying statement, Table I, gives the segregated data of production of clean oil and water in the various oil fields of the State for the semiannual period closing June 30, 1950. These data are compiled by the field offices of the Division of Oil and Gas from the monthly production reports, giving the individual well productions, filed with the State Oil and Gas Supervisor by all producing companies.

The total production of the State for the first six months of 1950 was 158,422,047 barrels of oil and 245,014,012 barrels of water, a decrease compared with the production of the previous six months of 6,251,634 barrels of oil and a decrease of 1,787,429 barrels of water.

Table II gives the average daily oil production and the average daily production and disposition of natural gas by fields monthly for the first six months of 1950.

Table III gives the estimate of the known gas reserves of the State as of January 1 and July 1, 1950. In a few fields new estimates have been made from those originally published in Vol. 28, No. 1 due to further study. They will continue to be amended in subsequent volumes of the "Summary" as additional data are obtained or new zones or fields discovered.

TABLE I

PRODUCTION STATISTICS OF CALIFORNIA OIL FIELDS—JANUARY 1 TO JUNE 30, 1950

Field	Average number of producing wells		Oil (bbl.)	Water including water in emulsion (bbl.)	Cumulative production of oil (bbl.)	Production per well per producing day		Percentage water	Percentage of time wells produced	Proved acreage	
						Barrels					
	Actual	Potential				Oil	Water			As of June 30, 1950	Maximum
DIST. 1—Aliso Canyon	51	69	666,642	64,323	10,917,519	81.3	7.8	8.8	88.8	880	880
Beverly Hills	2	2	15,609	45,478	4,090,446	43.8	127.7	74.4	98.3	15	120
Brea-Olinda	379	586	1,918,520	1,805,938	206,079,423	28.5	26.8	48.5	98.2	1,588	1,738
Coyote, East	194	253	794,904	1,116,518	62,517,834	23.7	33.2	58.4	95.6	[1]1,245	[1]1,465
Coyote, West	279	305	2,006,545	2,695,890	166,833,944	41.0	55.0	57.3	97.0	[1]1,003	[1]1,048
Del Valle	49	54	607,633	606,908	12,408,512	71.3	71.2	50.0	96.1	515	535
Dominguez	346	377	2,298,806	2,723,196	185,564,191	37.8	44.8	54.2	97.0	1,300	1,440
El Segundo	21	25	58,006	326,955	12,240,762	15.5	87.6	84.9	98.2	330	773
Gas Zone*	3	5									
Huntington Beach	1,176	1,400	9,713,422	6,831,142	447,638,542	47.2	33.2	41.3	96.8	3,733	4,010
Inglewood	373	396	2,384,422	5,884,002	172,947,071	36.9	91.0	71.1	95.8	945	970
Lawndale	11	11	102,766	589,887	1,806,415	59.1	339.4	85.2	87.3	100	128
Long Beach	1,119	1,271	4,094,770	15,523,727	744,681,441	20.8	79.0	79.1	97.1	1,218	1,555
Los Angeles City	90	90	37,847	149,643	20,323,477	2.5	9.7	79.8	94.6	250	780
Los Angeles, East	14	14	253,353	214,781	1,698,007	107.3	91.0	45.9	93.2	160	160
Montebello	332	385	1,093,387	6,439,982	154,340,906	18.9	111.4	85.5	96.2	1,373	1,590
Newhall	18	79	13,846	9,874	5,982,863	4.7	3.4	41.6	90.4	330	570
Newhall-Potrero	75	96	1,514,227	50,289	21,400,693	117.5	3.9	3.2	94.9	1,025	1,025
Newport	0	6	0	0	166,582	0.0	0.0	0.0	0.0	30	175
Newport, West	182	211	906,646	516,842	10,382,565	28.5	16.2	36.3	96.7	855	905
Gas Zone*	0	1									
Oak Canyon	19	20	290,910	34,722	4,550,331	90.1	10.8	10.7	93.9	270	270
Placerita	278	289	3,267,667	155,654	8,545,041	67.7	3.2	4.5	95.9	590	615
Playa del Rey	113	149	297,890	2,360,415	53,037,777	15.1	119.4	88.8	96.7	475	580
Potrero	38	41	251,873	310,255	7,337,119	38.0	46.9	55.2	96.3	285	325
Richfield	347	376	1,177,179	1,336,971	116,395,392	19.4	22.0	53.2	96.7	1,300	1,523
Rosecrans	206	241	1,041,890	1,127,929	66,297,788	29.1	31.5	52.0	95.9	910	1,045
Salt Lake	7	7	36,244	232,430	43,171,893	30.8	197.6	86.5	92.8	15	905
Santa Fe Springs	523	610	2,616,102	11,579,642	531,290,227	28.5	126.2	81.6	96.9	1,020	1,420
Seal Beach	204	222	2,107,759	5,119,608	120,262,221	61.5	149.3	70.8	92.9	620	690
Torrance	747	830	1,294,801	1,372,704	128,356,471	9.9	10.5	51.5	96.6	4,633	5,798
Turnbull	5	5	14,007	26,825	553,301	15.6	29.8	65.7	99.3	55	75
Whittier	105	238	297,305	440,333	22,369,210	17.0	25.2	59.7	92.0	675	783
Wilmington	2,006	2,297	21,295,568	6,982,329	482,563,448	60.5	19.8	24.7	96.9	5,560	5,565
Los Angeles County:											
Alondra Area	4	5	60,588	57,507	941,863	91.9	87.3	48.7	91.0	50	50
Castaic Area	1	1	116	6,200	116	1.1	59.6	98.2	57.5	10	10
East Dominguez Area	1	1	3,718	12,246	36,732	21.9	72.0	76.7	93.9	10	10
Hyperion Area	2	4	6,659	1,094	150,016	37.8	6.2	14.1	48.6	40	40
Leffingwell Area	1	1	812	2,067	20,016	4.6	11.6	71.3	98.3	10	10
Puente Area	1	2	932	1,434	9,147	5.8	8.9	60.6	89.0	20	20
Northwest Rosecrans Area	1	1	816	101	43,037	4.5	0.6	11.0	99.5	10	30

	Simi Area	0	6	0	0	2,656	0.0	0.0	0.0	0.0	10	10
	Whittier Heights Area	1	3	1,246	20	28,762	8.3	0.1	1.6	82.9	20	40
	Orange County:											
	Buena Park Area	1	1	4,227	23,235	234,184	23.6	129.8	84.6	98.9	10	30
	Talbert Area	1	1	1,835	2,101	23,296	10.2	11.7	53.4	99.4	10	10
	San Bernardino County:											
	Chino-Mahala Area	3	5	1,367	3,045	22,081	6.9	15.3	69.0	36.7	20	20
	District totals	9,326	10,986	62,552,853	76,784,242	3,828,263,318	38.4	47.2	55.1	96.5	33,523	39,741
	Imperial carbon dioxide gas*	17	47								300	620
Dist. 2—	Bardsdale	219	258	467,163	134,446	19,350,639	12.4	3.6	22.3	95.0	1,090	1,180
	Montalvo, West	9	9	128,436	6,390	603,802	92.3	4.6	4.7	85.5	340	340
	Ojai	62	116	28,039	20,810	4,037,297	3.6	2.6	42.6	70.3	745	880
	Oxnard	5	12	58,340	835	3,304,597	89.1	1.3	1.4	72.4	230	230
	Piru	85	111	118,222	81,910	[3]7,593,624	9.1	6.3	40.9	84.7	375	630
	Ramona	98	104	[3]891,318	[3]73,961	7,003,338	51.6	4.3	7.7	97.3	[4]555	[4]560
	Rincon	239	266	3,072,578	684,722	59,081,048	78.1	17.4	18.2	90.9	1,705	1,730
	Santa Paula	40	52	59,062	60,744	2,506,955	10.1	10.4	50.7	80.5	235	480
	Sespe	35	42	50,130	41,046	3,677,731	9.4	7.7	45.0	84.2	270	655
	Simi	52	73	10,279	1,826	2,420,817	1.1	0.2	15.1	98.5	570	625
	South Mountain	213	228	1,301,810	104,612	34,832,096	35.4	2.8	7.4	95.3	1,490	1,515
	Temescal	22	22	93,195	125,709	4,225,615	23.6	31.8	57.4	99.3	170	170
	Ventura	687	763	10,335,981	2,100,975	386,558,175	95.8	19.5	16.9	86.8	2,720	2,720
	Ventura County:											
	South Tapo Canyon Area	1	1	456	6,870	456	6.9	104.1	93.8	36.5	10	10
	District totals	1,767	2,057	16,615,009	3,444,856	535,196,190	58.0	12.0	17.2	89.5	10,505	11,725
Dist. 3—	Arroyo Grande	26	48	32,193	176,661	1,569,087	7.9	43.2	84.6	86.8	340	600
	Capitan	69	75	409,970	2,422,130	13,984,209	33.5	197.7	85.5	98.1	230	370
	Casmalia	18	97	47,813	171,214	16,187,809	15.9	56.9	78.2	92.4	1,110	1,940
	Cat Canyon	186	304	2,585,661	2,813,909	66,213,149	81.4	88.6	52.1	94.4	3,430	3,430
	Elwood	72	94	1,236,354	1,960,970	86,852,552	99.4	157.6	61.3	95.5	630	[6]710
	La Goleta Gas*	11	11			283					310	400
	Lompoc	7	110	121,713	172,420	17,248,923	110.5	156.6	58.6	86.9	1,960	3,060
	Mesa	5	7	4,000	21,880	3,626,985	5.4	29.4	84.5	82.2	8	[6]200
	Moody Gulch	1	1	295	13	62,755	16.4	0.7	4.2	9.9	10	[6]70
	Morales	2	6	44,877	101	44,877	225.5	0.5	0.2	55.0	50	50
	Orcutt	251	322	727,169	1,365,307	109,932,020	18.3	34.4	65.2	87.4	3,460	4,900
	Russell Ranch	132	142	4,042,855	352,918	11,758,629	175.2	15.3	8.0	96.6	1,170	1,170
	San Ardo	16	64	71,503	563	672,577	123.5	1.0	0.8	20.0	880	880
	Santa Maria Valley	417	504	2,232,333	3,805,015	99,465,246	31.7	54.0	63.0	93.3	6,290	[6]6,410
	South Cuyama	98	124	3,139,603	34,065	4,327,798	192.2	2.1	1.1	92.1	2,080	2,080
	Summerland	5	16	3,685	2,653	3,196,952	4.7	3.4	41.9	86.1	[6]100	[6]260
	Gas Zone*	2	2									
	Zaca	0	19	0	0	1,631,304					280	280
	Monterey County	0	1	0	0	686					10	10
	San Benito County	1	1	734	51	3,532	4.3	0.3	6.5	94.5	10	[6]20
	San Luis Obispo County: Guadalupe Area	2	6	3,097	615	26,437	14.7	2.9	16.6	58.3	50	50
	Santa Barbara County	0	6	0	0	20,112					60	[6]100
	District totals	1,308	1,947	14,703,855	13,300,485	436,825,922	67.8	61.3	47.5	91.7	22,468	26,990

TABLE I—Continued

PRODUCTION STATISTICS OF CALIFORNIA OIL FIELDS—JANUARY 1 TO JUNE 30, 1950

Field	Average number of producing wells		Oil (bbl.)	Water including water in emulsion (bbl.)	Cumulative production of oil (bbl.)	Production per well per producing day		Percentage water	Percentage of time wells produced	Proved acreage	
						Barrels					
	Actual	Potential				Oil	Water			As of June 30, 1950	Maximum
Dist. 4—Antelope Hills	26	32	227,261	799,553	4,371,273	58.2	204.9	77.9	82.9	255	255
Ant Hill	21	35	53,794	189,825	2,027,156	22.4	79.0	77.9	63.2	295	305
Belridge, North	55	143	514,472	308,433	57,952,062	59.0	35.4	37.5	87.6	1,865	1,905
Belridge, South	357	1,097	740,188	736,036	48,255,257	12.2	12.1	49.9	93.6	7,355	7,470
Blackwells Corner	25	28	19,065	151,182	355,658	4.4	35.0	88.8	95.6	190	200
Bowerbank Gas*	1	3								1,360	1,360
Buttonwillow Gas*	1	2								80	1,720
Canal	30	39	334,475	56,937	14,894,916	68.4	11.6	14.5	90.1	780	780
Canfield Ranch	18	18	296,072	66,033	975,735	98.1	21.9	18.2	92.6	310	310
Coles Levee, North	115	131	3,045,344	120,168	52,353,238	148.7	5.9	3.8	98.4	3,440	3,440
Gas Zone*	1	3									
Coles Levee, South	63	71	1,167,527	47 965	18,429,252	109.9	4.5	3.9	93.2	3,230	3,230
Gas Zone*	3	3									
Cymric	286	439	2,275,147	3,439,962	37,022,194	47.3	71.5	60.2	92.9	2,475	2,540
Devils Den	13	40	26,159	54,040	210,319	12.4	25.9	67.6	88.7	250	350
Edison	350	401	2,132,241	2,623,364	[3]36,524,401	35.9	44.1	55.2	93.8	3,390	3,565
Elk Hills	157	723	1,444,866	2,323,595	202,947,326	79.7	128.1	61.7	63.8	17,650	17,770
Gas Zone*	3	8									
Fruitvale	205	255	1,347,303	2,401,518	48,153,844	39.7	70.7	64.1	91.5	2,255	2,470
Greeley	93	103	2,017,767	845,532	44,229,965	140.3	58.8	29.5	85.5	1,950	2,060
Kern Bluff	94	113	244,932	605,991	1,594,702	14.5	36.0	71.2	99.1	485	490
Kern Front	545	710	1,076,858	4,432,084	72,569,296	11.1	45.8	80.5	98.3	4,225	4,240
Kern River	1,948	2,923	1,402,180	24,194,584	305,346,543	4.2	71.6	94.5	95.8	8,125	8,175
Lost Hills	552	659	1,007,776	3,638,527	65,946,405	10.3	37.3	78.3	97.6	3,230	3,390
McDonald Anticline	19	23	37,263	148,410	379,132	11.2	44.7	79.9	96.5	160	170
McKittrick-Temblor	120	314	373,316	1,698,024	97,978,877	17.9	81.3	82.0	96.2	1,420	1,550
Midway-Sunset	3,320	4,587	11,395,258	16,951,612	1,136,135,230	20.3	30.3	59.8	93.2	[8]43,545	[9]48,000
Buena Vista Gas Zone*	11	39									
Mount Poso	537	560	1,915,214	39,018,376	107,373,854	20.1	410.4	95.3	97.8	3,105	3,235
Mountain View	158	210	567,417	871,220	[4]52,298,049	21.3	32.8	60.6	92.9	1,970	2,775
Paloma	122	148	2,740,925	107,759	28,301,658	133.3	5.2	3.8	93.1	6,410	6,420
Gas Zone*	0	5									
Poso Creek	165	257	317,534	2,155,227	14,476,627	11.4	77.3	87.2	93.4	2,005	2,040
Rio Bravo	94	100	1,854,498	616,616	53,402,526	114.3	38.0	25.0	95.4	1,870	1,890
Round Mountain	342	357	1,086,406	22,946,676	59,397,924	17.8	376.6	95.5	98.4	2,390	2,425
Semitropic Gas*	3	7								620	3,510
Strand	20	21	173,884	422,288	6,443,099	50.4	122.5	70.8	95.2	340	380
Tejon	88	97	407,331	411,217	4,402,322	26.4	26.7	50.2	96.8	1,045	1,055

Tejon Hills	46	59	237,066	45,639	524,512	31.2	6.0	16.1	91.2	495	495
Ten Section	117	132	1,059,479	373,649	47,521,704	51.4	18.1	26.1	97.3	1,880	1 910
Trico Gas*	31	79								[10]10,168	[10]10,508
Wasco	4	4	37,823	189,449	4,781,847	59.3	296.9	83.4	88.1	150	260
Wheeler Ridge	54	54	139,326	25,873	5,032,152	14.6	2.7	15.7	97.8	405	465
Kern County:											
Antelope Hills Area, North	1	1	807	49	807	161.4	9.8	5.7	2.8	10	10
Antelope Plains Area*	1	1								10	10
Ant Hill Area, South	0	1	0	0	1,215	0	0	0	0	10	10
Bellevue Area	3	3	42,569	78,321	833,495	78.4	144.2	64.8	100.0	60	60
Calders Corner Area	2	3	29,303	6,864	74,035	69.9	16.4	19.0	86.4	50	50
Chico-Martinez Area	1	4	488	178	56,992	7.1	2.6	26.7	38.1	30	40
Dyer Creek Area	1	1	983	30,792	33,232	6.0	188.9	96.9	90.1	10	20
Jasmine Area	7	9	20,193	95,669	190,723	16.3	77.3	82.6	97.7	80	80
Los Lobos Area	1	1	141	15	1,230	4.7	1.0	9.6	16.6	10	10
McClung Area	1	1	68	4,650	106,256	2.2	150.0	98.6	17.1	10	10
District totals	10,176	14,907	[11]41,810,719	133,233,902	2,633,907,040	24.1	76.8	76.1	94.2	141,453	153,413
DIST. 5—Afton Gas*	2	2								40	40
Cache Slough Gas*	3	5								300	300
Coalinga	1,125	1,867	2,917,175	3,821,990	441,948,969	15.0	19.7	56.7	95.4	16,874	17,807
Dunnigan Hills Gas*	4	6								780	780
East Coalinga Extension	147	228	8,298,722	6,787,097	191,580,470	336.9	275.5	45.0	92.6	4,200	4,510
Eureka Gas*	5	5								460	540
Fairfield Knolls Gas*	1	2								240	240
Gill Ranch Gas*	6	10								810	810
Guijarral Hills	74	74	2,778,740	166,128	5,774,675	221.9	13.2	5.6	93.5	1,240	1,240
Helm	75	95	617,233	977,605	10,641,188	49.1	77.7	61.3	92.6	4,140	4,525
Jacalitos	110	119	851,198	245,141	12,318,733	44.0	12.7	22.4	97.1	2,510	2,590
Kettleman Middle Dome	2	2	35,264	26,829	704,658	98.5	74.9	43.2	98.9	80	180
Kettleman North Dome	320	440	5,358,436	3,935,966	367,588,232	96.5	70.9	42.3	95.8	13,075	13,390
Kirby Hill Gas*	6	10								730	730
Lodi Gas*	4	4								1,450	1,450
Maine Prairie Gas*	7	7								850	850
Marysville Buttes Gas*	6	7								840	840
McDonald Island Gas*	11	12								1,130	1,130
Millar Gas*	3	3								160	160
Ord Bend Gas*	2	3								210	210
Pleasant Valley	21	25	471,055	378,203	8,240,027	131.3	105.4	44.5	94.4	430	500
Pyramid Hills	24	27	37,077	23,500	616,694	9.0	5.7	38.8	94.5	150	150
Raisin City	66	69	783,108	1,281,143	8,033,600	70.7	115.7	62.1	92.7	1,240	1,305
Rio Vista Gas*	144	159								[12]23,154	[12]23,154
Riverdale	45	53	420,285	436,667	9,335,763	55.4	57.5	51.0	93.2	1,200	1,630
Roberts Island Gas*	1	1								20	20
Suisun Bay Gas*	3	3								60	60
Thornton Gas*	9	10								4,960	4,960
Tracy Gas*	1	2								175	175
Vernalis Gas*	2	2								100	100
Willows Gas*	0	2								20	20
Winters Gas*	3	5								420	420

TABLE I—Continued

PRODUCTION STATISTICS OF CALIFORNIA OIL FIELDS—JANUARY 1 TO JUNE 30, 1950

Field	Average number of producing wells		Oil (bbl.)	Water including water in emulsion (bbl.)	Cumulative production of oil (bbl.)	Production per well per producing day		Percentage water	Percentage of time wells produced	Proved acreage	
						Barrels					
	Actual	Potential				Oil	Water			As of June 30, 1950	Maximum
DIST. 5—Continued											
Butte County:											
Chico Area*	1	2								20	20
Durham Area*	4	4								80	80
Fresno County:											
Burrel Area	9	9	122,370	105,532	293,956	75.9	65.5	46.3	99.0	200	210
Cantua Creek Area	0	1	0	0	3,649					10	10
Cheney Ranch Area	1	1	721	74	11,210	4.1	0.4	9.3	98.3	10	10
Kreyenhagen Area	0	2	0	0	309					10	10
San Joaquin Area	6	6	47,664	64,619	331,130	43.6	59.2	57.6	95.2	140	170
Kings County:											
Trico Area, Northwest*	1	2								40	40
Madera County:											
Chowchilla Area*	0	3								80	80
Moffatt Ranch Area*	2	2								40	40
San Joaquin County: Galt Area*	1	1								20	20
Solano County: Denverton Area*	1	1								20	40
Sonoma County:											
Petaluma Area	1	1	563	33	7,412	2.3	0.2	5.5	86.7	50	50
Gas Zone*	0	2									
Tehama County: Corning Area*	0	5								300	300
Yolo County: Pleasant Creek Area*	0	2								120	120
District totals	2,026	3,019	22,739,611	18,250,527	1,057,430,666	65.2	52.4	44.5	95.1	83,188	86,016
Grand totals	24,603	32,916	[11]158,422,047	245,014,012	8,491,623,136					291,137	317,885
Abandoned fields					1,241,095						651
STATE TOTALS					8,492,864,418						318,536

* Dry gas wells omitted from well totals.

[1] Boundaries of fields changed causing changes in figures from those previously published.

[2] 4,132,420 bbl. cumulative production of oil transferred from Piru field to new Temescal field January 1, 1950.

[3] Figures include 285,488 bbl. of oil and 18,050 bbl. of water produced in Los Angeles County portion of Ramona field.

[4] Includes 300 acres in Los Angeles County, District No. 1.

[5] Includes 305 acres in Los Angeles County, District No. 1.

[6] Revised figure.

[7] Corrected figure due to field boundary change.

[8] Includes 65 acres in San Luis Obispo County, District No. 3.

[9] Includes 120 acres in San Luis Obispo County, District No. 3.

[10] Includes 1,000 acres in Kings County, District No. 5.

[11] Includes 1,344,728 bbl. condensate from South Coles Levee and Paloma.

[12] Includes 953 acres in Contra Costa County, District No. 3.

ABANDONED FIELDS OR AREAS

	Cumulative production		Proved acreage maximum
	Oil fields (bbl.)	Gas fields (Mcf.)	
DIST. 1—Los Angeles County:			
Lapworth Area	54,829		10
La Mirada Area	20,571		10
Ramona Area	1,606		10
Rowland Area	1,885		10
DIST. 2—Ventura County: Conejo Field	102,000		95
DIST. 3—Santa Barbara County: Goleta Field	140,281		50
Santa Clara County: Sargent Field	783,759		[1]160
San Luis Obispo County: Huasna Area	11,470		10
San Mateo County: Half Moon Bay Area	41,330		[1]150
DIST. 4—Kern County:			
Comanche Area	55		[1]1
Northeast Edison Area	695		[1]5
Grapevine Area	3,871		[1]10
McKittrick Area	1,076		10
Shafter Area	54,651		60
Tulare County: Terra Bella Area	23,016		40
DIST. 5—Solano County: Honker Area (gas)		300,788	20
Totals	1,241,095	300,788	651

[1] Revised figure.

TABLE II

AVERAGE DAILY BBL. OIL, AND AVERAGE DAILY FORMATION GAS PRODUCTION AND DISPOSITION, MCF.—JANUARY 1 TO JUNE 30, 1950

Field	JANUARY				FEBRUARY				MARCH			
	Oil	Gas			Oil	Gas			Oil	Gas		
	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air
Dist. 1—Aliso Canyon	3,497	2,568	2,483	85	3,598	3,133	3,047	86	3,603	3,072	2,846	226
Beverly Hills	82	10	10	0	87	10	10	0	88	10	10	0
Brea-Olinda	10,737	8,625	8,611	14	10,726	8,804	8,770	34	10,828	7,979	7,979	0
Gas Storage		[3]391	[3]391	0		[4]446	[4]446	0		[3]360	[3]360	0
Coyote, East	4,149	3,026	3,013	13	4,244	3,036	3,018	18	4,267	2,718	2,711	7
Coyote, West	11,324	13,516	13,495	21	11,279	14,461	14,193	268	11,295	11,742	11,726	16
Del Valle	3,415	11,640	11,403	237	3,420	11,982	11,534	448	3,465	12,112	11,277	835
Dominguez	12,278	17,444	17,425	19	12,217	18,803	18,786	17	12,348	16,219	16,200	19
El Segundo	309	132	115	17	320	152	137	15	340	172	156	16
Gas Zone*		[1](4)	0	0		[1](1,378)	0	0		[1](2,055)	0	0
Huntington Beach	53,287	40,799	40,772	27	53,465	41,450	41,418	32	53,804	41,615	41,590	25
Inglewood	13,100	9,800	9,789	11	13,410	10,174	10,160	14	13,456	10,272	10,263	9
Lawndale	457	278	271	7	647	408	408	0	591	416	416	0
Long Beach	22,414	19,549	19,549	0	22,653	19,706	19,706	0	22,528	19,803	19,803	0
Los Angeles City	192	0	0	0	206	0	0	0	204	0	0	0
Los Angeles, East	1,328	2,062	2,021	41	1,319	2,070	2,062	8	1,318	2,203	2,198	5
Montebello	5,808	7,285	7,222	63	6,051	7,541	7,483	58	6,283	7,498	7,339	159
Newhall	80	58	30	28	80	56	29	27	84	57	30	27
Newhall-Potrero	8,867	6,954	6,921	33	8,533	5,138	5,138	0	8,257	4,625	4,625	0
Newport	0	0	0	0	0	0	0	0	0	0	0	0
Newport, West	5,249	1,107	1,107	0	5,085	1,049	1,049	0	4,970	1,051	1,051	0
Gas Zone*		0	0	0		0	0	0		0	0	0
Oak Canyon	1,694	2,043	2,043	0	1,600	2,001	1,822	179	1,629	2,143	2,046	97
Placerita	21,584	10,306	465	9,841	20,283	5,705	652	5,053	18,621	3,613	398	3,215
Playa del Rey	1,636	1,953	1,925	28	1,603	2,295	2,278	17	1,604	1,713	1,692	21
Del Rey Hills Gas Storage		[3]3,213	[3]3,213	0		[4]863	[4]863	0		[3]7,539	[3]7,539	0
Potrero	1,626	19,566	19,566	0	1,478	20,887	20,887	0	1,377	20,016	20,016	0
Richfield	6,414	5,158	5,139	19	6,366	5,242	5,225	17	6,503	4,757	4,744	13
Rosecrans	6,144	15,934	15,779	155	6,109	17,055	16,997	58	5,775	14,107	14,002	105
Salt Lake	180	0	0	0	176	0	0	0	192	0	0	0
Santa Fe Springs	14,788	13,123	13,123	0	14,564	13,856	13,854	2	14,325	12,731	12,731	0
Seal Beach	11,460	9,964	9,947	17	11,603	10,151	10,137	14	11,805	11,249	11,235	14
Torrance	7,112	4,013	3,992	21	7,313	4,175	4,154	21	7,089	4,207	4,186	21
Turnbull	83	69	35	34	78	69	35	34	76	68	35	33
Whittier	1,458	807	613	194	1,591	977	977	0	1,550	886	777	109
Wilmington	109,245	111,538	111,367	171	111,908	116,024	115,805	219	115,374	116,662	116,595	67

Los Angeles County:												
Alondra Area	333	207	207	0	334	197	197	0	366	233	233	0
Castaic Area									2	8	0	8
East Dominguez Area	18	33	16	17	22	31	15	16	18	26	14	12
Hyperion Area	31	6	6	0	21	2	2	0	52	9	8	1
Leffingwell Area	5	32	32	0	5	36	36	0	5	33	33	0
Puente Area	7	0	0	0	5	0	0	0	6	0	0	0
Northwest Rosecrans Area	5	0	0	0	5	0	0	0	4	0	0	0
Simi Area	0	0	0	0	0	0	0	0	0	0	0	0
Whittier Heights Area	7	0	0	0	7	0	0	0	7	0	0	0
Orange County:												
Buena Park Area	24	5	5	0	32	5	5	0	25	5	5	0
Talbert Area	7	0	0	0	11	0	0	0	13	0	0	0
San Bernardino County:												
Chino-Mahala Area	3	0	0	0	4	0	0	0	3	0	0	0
District totals	340,437	339,610	328,497	11,113	342,458	346,681	340,026	6,655	344,150	334,030	328,970	5,060
Net gas storage		(4)				(1,378)				(2,055)		
Gas returned from storage		3,604	3,604	0		1,309	1,309	0		7,899	7,899	0
Imperial carbon dioxide gas*		246	246	0		249	249	0		237	237	0
Dist. 2—Bardsdale	2,509	5,621	5,501	120	2,563	5,560	5,540	20	2,565	5,498	5,448	50
Montalvo, West	647	1,282	1,265	17	673	1,348	1,303	45	623	1,258	1,202	56
Ojai	147	27	16	11	172	29	24	5	165	81	21	60
Oxnard	199	123	122	1	225	2	0	2	133	1	0	1
Piru	667	734	298	436	668	766	325	441	651	756	297	459
Ramona	4,922	5,570	5,562	8	4,961	6,022	6,016	6	4,910	6,260	6,246	14
Rincon	16,271	28,903	28,450	453	15,717	27,646	27,406	240	16,820	28,090	27,878	212
Santa Paula	342	11	11	0	317	14	14	0	324	13	13	0
Sespe	323	39	29	10	294	42	31	11	286	40	30	10
Simi	52	3	3	0	56	4	4	0	57	3	3	0
South Mountain	7,369	9,602	9,362	240	7,046	9,707	9,617	90	7,017	10,175	10,075	100
Temescal	509	473	359	114	535	497	383	114	516	472	358	114
Ventura	58,469	106,017	105,459	558	57,804	107,849	107,411	438	57,103	107,826	107,741	85
Ventura County:												
South Tapo Canyon Area									7	0	0	0
District totals	92,426	158,405	156,437	1,968	91,031	159,486	158,074	1,412	91,177	160,473	159,312	1,161
Net gas storage		0				0				0		
Gas returned from storage		0	0	0		0	0	0		0	0	0
Dist. 3—Arroyo Grande	249	15	15	0	176	16	16	0	162	15	15	0
Capitan	2,312	2,140	1,812	328	2,525	2,442	2,439	3	2,320	2,487	2,474	13
Casmalia	276	332	113	219	272	350	117	233	244	318	236	82
Cat Canyon	14,960	4,361	3,694	667	14,168	4,420	4,027	393	14,054	3,866	3,302	564
Elwood	7,010	5,294	5,294	0	7,110	5,590	5,579	11	7,072	5,427	5,427	0
La Goleta Gas*		[1]133,907	[1]133,907	0		[1]63,320	[1]63,320	0		[1]20,312	[1]20,312	0
Lompoc	35	11	11	0	39	12	12	0	38	14	14	0
Mesa	25	0	0	0	24	0	0	0	19	0	0	0
Moody Gulch	2	0	0	0	2	0	0	0	2	0	0	0
Morales												

TABLE II—Continued

AVERAGE DAILY BBL. OIL, AND AVERAGE DAILY FORMATION GAS PRODUCTION AND DISPOSITION, MCF.—JANUARY 1 TO JUNE 30, 1950

Field	JANUARY				FEBRUARY				MARCH			
	Oil	Gas			Oil	Gas			Oil	Gas		
	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air
DIST. 3—Continued												
Orcutt	4,499	7,362	7,357	5	3,596	7,225	7,222	3	3,517	5,836	5,835	1
Russell Ranch	23,833	6,820	2,450	4,370	24,419	9,327	3,278	6,049	21,284	7,490	3,315	4,175
San Ardo	700	3	3	0	66	4	4	0	353	3	3	0
Santa Maria Valley	12,917	29,468	28,996	472	12,657	32,159	31,680	479	12,348	26,193	25,565	628
South Cuyama	12,438	4,817	2,042	2,775	13,861	6,534	925	5,609	16,032	6,608	488	6,120
Summerland	15	0	0	0	21	0	0	0	20	0	0	0
Gas Zone*		623	623	0		689	689	0		703	703	0
Zaca	0	0	0	0	0	0	0	0	0	0	0	0
Monterey County	0	0	0	0	0	0	0	0	0	0	0	0
San Benito County	4	0	0	0	4	0	0	0	2	0	0	0
San Luis Obispo County:												
Guadalupe Area	0	0	0	0	0	0	0	0	0	0	0	0
Santa Barbara County	0	0	0	0	0	0	0	0	0	0	0	0
District totals	79,275	61,246	52,410	8,836	78,940	68,768	55,988	12,780	77,467	58,960	47,377	11,583
Net gas storage		0				0				0		
Gas returned from storage		133,907	133,907	0		63,320	63,320	0		20,312	20,312	0
DIST. 4—Antelope Hills	949	549	475	74	926	390	363	27	1,333	548	528	20
Ant Hill	706	28	28	0	660	25	25	0	74	11	11	0
Belridge, North	3,324	71,752	71,470	282	2,598	23,031	22,916	115	2,755	27,776	27,674	102
Temblor Gas Storage[2]		[1](15,235)				[1]600	[1]600	0		[1]604	[1]604	0
Belridge, South	3,504	346	346	0	3,755	504	504	0	4,217	579	579	0
Blackwells Corner	105	19	19	0	107	21	21	0	105	19	19	0
Bowerbank Gas*		529	529	0		403	403	0		168	168	0
Buttonwillow Gas*		347	347	0		0	0	0		280	280	0
Canal	1,889	2,541	2,541	0	1,881	3,401	3,390	11	1,853	3,284	3,284	0
Canfield Ranch	1,563	1,764	1,727	37	1,648	1,808	1,770	38	1,599	1,817	1,701	116
Coles Levee, North	16,848	[1](2,740)		[1]123	16,763	[1](4,346)		[1]209	16,919	[1](3,874)		[1]169
Gas Zone*		4,303	4,303	0		4,660	4,660	0		3,005	3,005	0
Coles Levee, South	6,530	6,351	6,346	5	6,494	6,152	6,142	10	6,477	5,627	5,625	2
Gas Zone*		5,215	5,215	0		5,487	5,487	0		5,180	5,180	0
Cymric	12,623	20,659	20,100	559	12,785	23,374	23,024	350	12,429	20,599	20,229	370
Devils Den	131	7	7	0	179	29	29	0	161	22	22	0
Edison	11,455	5,484	5,264	220	11,750	5,565	5,320	245	11,641	5,471	5,305	166

Elk Hills	11,367	[5]591	0	[5]591 [6]668	9,311	[1](1,260)		[4]663	5,965	[1](3,028)		[3]363
Gas Zone*		3,788	3,788	0		4,816	4,816	0		6,073	6,073	0
Fruitvale	7,958	1,160	1,129	31	7,123	1,083	1,083	0	7,596	1,062	1,062	0
Greeley	11,127	2,478	2,477	1	11,155	3,354	3,353	1	11,133	2,652	2,651	1
Kern Bluff	1,320	0	0	0	1,239	0	0	0	1,269	0	0	0
Kern Front	6,038	683	638	45	5,951	693	649	44	6,056	644	600	44
Kern River	7,549	9	9	0	7,719	9	9	0	7,607	9	9	0
Lost Hills	5,663	4,070	3,186	884	5,647	4,094	3,213	881	5,646	3,999	3,192	807
McDonald Anticline	208	400	399	1	216	511	510	1	214	497	496	1
McKittrick-Temblor	2,057	1,374	1,343	31	2,105	1,388	1,367	21	2,095	1,371	1,361	10
Midway-Sunset	63,380	27,499	27,198	301	63,767	28,279	27,926	353	64,239	29,103	28,744	359
"Buena Vista Gas Zone*		[2]2,024 1,555	[2]2,024 1,555	0		3,753	3,753	0		1,092	1,092	0
Mount Poso	10,707	224	224	0	10,627	218	218	0	10,607	220	210	10
Mountain View	2,951	3,710	3,590	120	3,071	4,008	3,892	116	3,009	4,060	3,930	130
Paloma	15,029	54,458	51,643	2,815	15,195	54,718	51,514	3,204	14,895	51,009	49,903	1,106
Gas Zone*		0	0	0		0	0	0		0	0	0
Poso Creek	1,793	97	88	9	1,838	100	100	0	1,732	102	93	9
Rio Bravo	10,159	6,042	5,833	209	10,233	5,316	5,281	35	10,255	4,886	4,851	35
Round Mountain	6,104	19	19	0	5,814	19	19	0	6,063	19	19	0
Semitropic Gas*		755	755	0		743	743	0		187	187	0
Strand	1,044	622	568	54	1,029	673	630	43	1,007	611	596	15
Tejon	2,319	832	790	42	2,332	790	750	40	2,232	888	852	36
Tejon Hills	992	45	3	42	1,048	50	3	47	1,152	51	4	47
Ten Section	5,850	19,435	19,435	0	6,129	19,065	19,005	60	6,135	18,612	18,612	0
Trico Gas*		57,189	57,189	0		20,421	20,421	0		5,925	5,925	0
Wasco	290	749	715	34	247	676	651	25	219	477	354	123
Wheeler Ridge	796	247	226	21	781	240	216	24	782	242	218	24
Kern County:												
Antelope Plains Area*		53	53	0		56	56	0		21	21	0
Ant Hill Area, South	0	0	0	0	0	0	0	0	0	0	0	0
Bellevue Area	248	151	83	68	253	154	105	49	237	144	104	40
Calders Corner Area	169	288	288	0	159	292	292	0	151	260	260	0
Chico-Martinez Area	9	0	0	0	8	0	0	0	0	0	0	0
Dyer Creek Area	5	0	0	0	6	0	0	0	7	0	0	0
Jasmine Area	111	0	0	0	115	0	0	0	111	0	0	0
Los Lobos Area	1	0	0	0	1	0	0	0	1	0	0	0
McClung Area	0	0	0	0	0	0	0	0	2	0	0	0
District totals	234,871	307,826	301,941	5,885	232,665	230,369	224,629	5,740	229,980	208,602	205,029	3,573
Net gas storage		(17,975)				(5,606)				(6,902)		
Gas returned from storage		2,615	2,024	591		600	600	0		604	604	0

TABLE II—Continued

AVERAGE DAILY BBL. OIL, AND AVERAGE DAILY FORMATION GAS PRODUCTION AND DISPOSITION, MCF.—JANUARY 1 TO JUNE 30, 1950

Field	JANUARY				FEBRUARY				MARCH			
	Oil	Gas			Oil	Gas			Oil	Gas		
	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air
Dist. 5—Afton Gas*		2,487	2,487	0		1,558	1,558	0		2,404	2,404	0
Cache Slough Gas*		6,427	6,427	0		5,596	5,596	0		5,438	5,438	0
Coalinga	16,441	2,265	1,906	359	15,955	2,285	1,912	373	15,321	2,084	1,758	326
Dunnigan Hills Gas*		3,256	3,248	8		4,668	4,668	0		4,466	4,466	0
East Coalinga Extension	46,536	59,456	58,872	584	46,765	55,932	55,181	751	45,024	50,285	45,274	5,011
Eureka Gas*		5,293	5,293	0		4,333	4,333	0		4,404	4,404	0
Fairfield Knolls Gas*		982	982	0		978	978	0		977	977	0
Gill Ranch Gas*		20,356	20,356	0		15,002	15,002	0		9,974	9,974	0
Guijarral Hills	14,678	9,370	8,861	509	15,594	10,091	8,750	1,341	15,265	10,632	10,007	625
Helm	3,492	13,762	13,753	9	3,408	13,813	13,813	0	3,508	13,716	13,716	0
Jacalitos	5,121	8,649	8,559	90	4,814	8,781	8,679	102	4,728	8,757	8,682	75
Kettleman Middle Dome	204	1,979	1,979	0	204	2,019	2,019	0	202	2,001	2,001	0
Kettleman North Dome	31,543	220,777	219,492	1,285	29,807	184,479	183,547	932	29,821	177,402	177,027	375
Kirby Hill Gas*		10,830	10,830	0		9,803	9,803	0		9,309	9,309	0
Lodi Gas*		2,678	2,678	0		2,372	2,372	0		2,411	2,411	0
Maine Prairie Gas*		4,741	4,741	0		4,330	4,329	1		3,330	3,330	0
Marysville Buttes Gas*		1,420	1,420	0		1,438	1,438	0		1,389	1,389	0
McDonald Island Gas*		35,223	35,219	4		30,867	30,867	0		14,621	14,621	0
Millar Gas*		4,564	4,564	0		5,034	5,034	0		4,813	4,813	0
Ord Bend Gas*		2,321	2,321	0		1,743	1,743	0		1,608	1,608	0
Pleasant Valley	2,591	3,151	3,059	92	2,472	2,737	2,423	314	2,399	1,881	1,625	256
Pyramid Hills	195	29	29	0	224	29	29	0	208	29	29	0
Raisin City	3,979	1,963	1,676	287	4,254	2,218	1,697	521	4,388	2,084	1,639	445
Rio Vista Gas*		462,252	462,250	2		463,666	463,643	23		445,060	445,041	19
Riverdale	2,463	3,829	3,764	65	2,491	3,876	3,864	12	2,346	3,964	3,951	13
Roberts Island Gas*		1,007	1,007	0		1,002	1,002	0		992	992	0
Suisun Bay Gas*		12,008	12,008	0		9,867	9,867	0		9,988	9,988	0
Thornton Gas*		16,848	16,848	0		13,166	13,166	0		10,283	10,282	1
Tracy Gas*		4,947	4,947	0		4,199	4,190	9		1,206	1,206	0
Vernalis Gas*		1,305	1,305	0		1,341	1,341	0		1,376	1,376	0
Willows Gas*		0	0	0		0	0	0		0	0	0
Winters Gas*		5,540	5,540	0		5,543	5,543	0		2,435	2,435	0
Butte County:												
Chico Area*		533	533	0		517	517	0		499	499	0
Durham Area*		3,012	3,012	0		2,245	2,245	0		2,100	2,100	0

Fresno County:												
Burrel Area	716	275	23	252	707	274	24	250	632	690	423	267
Cantua Creek Area	0	0	0	0	0	0	0	0	0	0	0	0
Cheney Ranch Area	4	96	48	48	4	173	173	0	4	91	91	0
Kreyenhagen Area	0	0	0	0	0	0	0	0	0	0	0	0
San Joaquin Area	287	101	32	69	267	99	31	68	274	90	28	62
Kings County:												
Trico Area, Northwest*		518	518	0		536	536	0		463	463	0
Madera County:												
Chowchilla Area*		0	0	0		0	0	0		0	0	0
Moffatt Ranch Area*		537	537	0		381	381	0		715	715	0
San Joaquin County:												
Galt Area*		728	728	0		524	524	0		317	317	0
Solano County:												
Denverton Area*		242	242	0		417	417	0		456	456	0
Sonoma County:												
Petaluma Area	2	0	0	0	2	0	0	0	0	0	0	0
Gas Zone*		0	0	0		0	0	0		0	0	0
Tehama County:												
Corning Area*		0	0	0		0	0	0		0	0	0
Yolo County:												
Pleasant Creek Area*		0	0	0		0	0	0		0	0	0
District totals	128,252	935,757	932,094	3,663	126,968	877,932	873,235	4,697	124,120	814,740	807,265	7,475
Net gas storage		0				0				0		
Gas returned from storage		0	0	0		0	0	0		0	0	0
Grand totals	875,261	1,802,844	1,771,379	31,465	872,062	1,683,236	1,651,952	31,284	866,894	1,576,805	1,547,953	28,852
Net gas storage		(17,979)	0	0		(6,984)	0	0		(8,957)	0	0
Gas returned from storage		140,126	139,535	591		65,229	65,229	0		28,815	28,815	0

* Dry gas wells.

[1] Considered to be returned from or delivered to storage.

Parentheses indicate negative figures due to storage. All figures are net; carried to separate totals.

Gas blown when there was net storage was replaced by gas from other sources, and is not included in totals because already accounted for at the field of origin.

[2] Oil produced from the Temblor zone is included with that shown in North Belridge.

[3] Blow in excess of net produced replaced by gas from other sources. Not included in totals.

TABLE II—Continued

AVERAGE DAILY BBL. OIL, AND AVERAGE DAILY FORMATION GAS PRODUCTION AND DISPOSITION, MCF.—JANUARY 1 TO JUNE 30, 1950

Field	APRIL				MAY				JUNE			
	Oil	Gas			Oil	Gas			Oil	Gas		
	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air
Dist. 1—Aliso Canyon	3,604	2,873	2,542	331	3,932	2,954	2,944	10	3,859	3,176	2,932	244
Beverly Hills	88	11	11	0	85	10	10	0	87	11	11	0
Brea-Olinda	10,484	8,585	8,585	0	10,542	8,345	8,345	0	10,278	8,284	8,284	0
Gas Storage		[4]430	[4]430	0		[3]351	[3]351	0		[3]340	[3]340	0
Coyote, East	4,320	3,117	3,109	8	4,261	2,893	2,888	5	5,115	3,856	3,853	3
Coyote, West	10,889	10,297	10,268	29	10,894	11,610	10,708	902	10,839	11,963	11,939	24
Del Valle	3,248	11,016	10,896	120	3,311	11,592	11,491	101	3,283	11,722	11,695	27
Dominguez	13,023	18,647	18,630	17	13,245	17,714	17,572	142	13,069	18,292	18,275	17
El Segundo	321	144	128	16	312	183	168	15	321	167	154	13
Gas Zone*		[1](2,373)				[1](705)				[2]29	[2]29	0
Huntington Beach	53,595	41,259	41,234	25	53,924	40,872	40,847	25	53,903	41,348	41,325	23
Inglewood	13,128	9,827	9,824	3	12,952	9,834	9,793	41	13,012	9,806	9,766	40
Lawndale	576	383	280	103	577	419	349	70	567	411	393	18
Long Beach	22,219	20,196	20,196	0	22,275	19,991	19,975	16	23,673	20,725	20,725	0
Los Angeles City	216	0	0	0	209	0	0	0	229	0	0	0
Los Angeles, East	1,375	2,349	2,184	165	1,500	2,643	2,360	283	1,555	2,760	2,296	464
Montebello	6,000	7,819	7,746	73	6,022	7,331	7,142	189	6,082	7,863	7,626	237
Newhall	69	53	29	24	78	46	27	19	67	57	28	29
Newhall-Potrero	8,479	4,112	4,112	0	8,143	4,401	4,394	7	7,922	4,140	4,140	0
Newport	0	0	0	0	0	0	0	0	0	0	0	0
Newport, West	4,940	1,074	1,074	0	4,929	1,044	1,044	0	4,884	1,038	1,038	0
Gas Zone*		0	0	0		0	0	0		0	0	0
Oak Canyon	1,600	2,085	2,039	46	1,563	2,067	2,036	31	1,556	1,938	1,917	21
Placerita	16,857	2,613	418	2,195	15,917	1,770	177	1,593	15,141	1,281	178	1,103
Playa del Rey	1,612	1,772	1,768	4	1,675	1,576	1,568	8	1,741	1,972	1,897	75
Del Rey Hills Gas Storage		[5]5,081	[5]5,081	0		[2]2,045	[2]2,045	0		[1]1,907	[1]1,907	0
Potrero	1,384	18,819	18,819	0	1,284	17,397	17,397	0	1,202	16,936	16,936	0
Richfield	6,607	5,152	5,139	13	6,557	5,131	5,118	13	6,567	5,280	5,254	26
Rosecrans	5,690	16,015	15,888	127	5,429	14,818	14,698	120	5,412	15,795	15,729	66
Salt Lake	223	0	0	0	224	0	0	0	205	0	0	0
Santa Fe Springs	14,317	13,596	13,569	27	14,412	13,353	13,348	5	14,317	13,997	13,997	0
Seal Beach	11,591	11,071	10,895	176	11,558	11,019	11,000	19	11,854	10,983	10,950	33
Torrance	7,036	4,209	4,189	20	7,195	4,214	4,208	6	7,190	4,364	4,356	8
Turnbull	76	70	36	34	76	69	36	33	76	70	35	35
Whittier	1,694	978	878	100	1,601	868	847	21	1,968	1,263	1,263	0
Wilmington	118,106	118,965	118,897	68	123,163	124,411	124,168	243	127,925	127,868	127,796	72

Los Angeles County:												
Alondra Area	350	236	236	0	347	230	230	0	276	195	192	3
Castaic Area	1	6	0	6	1	4	0	4	1	7	0	7
East Dominguez Area	29	37	18	19	19	35	18	17	19	28	14	14
Hyperion Area	33	6	6	0	50	7	6	1	31	6	6	0
Leffingwell Area	4	32	32	0	4	14	14	0	5	28	28	0
Puente Area	4	0	0	0	7	0	0	0	2	0	0	0
Northwest Rosecrans Area	5	0	0	0	4	0	0	0	4	0	0	0
Simi Area	0	0	0	0	0	0	0	0	0	0	0	0
Whittier Heights Area	8	0	0	0	5	0	0	0	7	0	0	0
Orange County:												
Buena Park Area	25	5	5	0	19	5	5	0	16	5	5	0
Talbert Area	11	0	0	0	7	0	0	0	12	0	0	0
San Bernardino County: Chino-Mahala Area	10	0	0	0	13	0	0	0	13	0	0	0
District totals	343,847	337,429	333,680	3,749	348,321	338,870	334,931	3,939	354,285	347,635	345,033	2,602
Net gas storage		(2,373)				(705)				0		
Gas returned from storage		5,511	5,511	0		2,396	2,396	0		2,276	2,276	0
Imperial carbon dioxide gas*		320	320	0		372	372	0		348	348	0
Dist. 2—Bardsdale	2,569	5,436	5,395	41	2,684	5,651	5,614	37	2,595	5,657	5,585	72
Montalvo, West	705	1,406	1,380	26	829	1,723	1,719	4	780	1,589	1,585	4
Ojai	152	82	22	60	150	101	42	59	144	37	34	3
Oxnard	86	1	0	1	505	2	0	2	784	3	0	3
Piru	644	735	303	432	643	722	294	428	647	738	296	442
Ramona	4,942	6,332	6,324	8	4,921	6,478	6,361	117	4,893	6,544	6,352	192
Rincon	16,836	28,741	28,618	123	17,863	32,472	32,419	53	18,263	34,717	34,610	107
Santa Paula	328	13	13	0	339	13	13	0	306	13	13	0
Sespe	257	40	30	10	251	40	30	10	252	40	30	10
Simi	59	3	3	0	60	3	3	0	57	3	3	0
South Mountain	6,924	10,125	10,015	110	7,380	11,724	11,540	184	7,402	11,850	11,706	144
Temescal	510	472	358	114	507	465	351	114	514	468	356	112
Ventura	55,242	106,187	106,071	116	56,334	107,254	107,095	159	57,705	108,545	108,445	100
Ventura County: South Tapo Canyon Area	3	0	0	0	4	0	0	0	1	0	0	0
District totals	89,257	159,573	158,532	1,041	92,470	166,648	165,481	1,167	94,343	170,204	169,015	1,189
Net gas storage		0				0				0		
Gas returned from storage		0	0	0		0	0	0		0	0	0
Dist. 3—Arroyo Grande	156	15	15	0	160	15	15	0	164	15	15	0
Capitan	2,251	2,310	2,278	32	2,165	2,331	2,302	29	2,034	2,238	2,231	7
Casmalia	267	349	332	17	266	331	331	0	261	385	385	0
Cat Canyon	13,862	3,781	3,189	592	14,404	3,710	3,029	681	14,237	3,959	3,405	554
Elwood	6,751	5,037	5,019	18	6,523	4,881	4,881	0	6,534	4,901	4,897	4
La Goleta Gas*		[1](1,670)				[1](27,981)				[1](32,753)		
Lompoc	680	73	29	44	1,222	96	35	61	2,004	262	66	196
Mesa	22	0	0	0	21	0	0	0	21	0	0	0
Moody Gulch	2	0	0	0	2	0	0	0	2	0	0	0
Morales	367	225	143	82	488	281	205	76	624	348	305	43
Orcutt	3,851	6,946	6,891	55	4,241	6,771	6,766	5	4,367	7,459	7,453	6
Russell Ranch	21,627	6,905	3,575	3,330	21,644	8,799	3,729	5,070	21,358	9,422	3,826	5,596

TABLE II—Continued

AVERAGE DAILY BBL. OIL, AND AVERAGE DAILY FORMATION GAS PRODUCTION AND DISPOSITION, MCF.—JANUARY 1 TO JUNE 30, 1950

Field	APRIL				MAY				JUNE			
	Oil	Gas			Oil	Gas			Oil	Gas		
	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air
DIST. 3—Continued												
San Ardo	413	3	3	0	387	3	3	0	421	3	3	0
Santa Maria Valley	12,141	28,925	28,286	639	12,086	24,775	24,398	377	11,861	25,972	25,657	315
South Cuyama	18,765	3,698	732	2,966	20,822	5,827	866	4,961	22,016	8,975	2,283	6,692
Summerland	22	0	0	0	21	0	0	0	22	0	0	0
Gas Zone*		678	678	0		620	620	0		549	549	0
Zaca	0	0	0	0	0	0	0	0	0	0	0	0
Monterey County	0	0	0	0	0	0	0	0	0	0	0	0
San Benito County	3	0	0	0	3	0	0	0	8	0	0	0
San Luis Obispo County: Guadalupe Area	0	0	0	0	32	4	4	0	71	8	8	0
Santa Barbara County	0	0	0	0	0	0	0	0	0	0	0	0
District totals	81,180	58,945	51,170	7,775	84,487	58,444	47,184	11,260	86,005	64,496	51,083	13,413
Net gas storage		(1,670)				(27,981)				(32,753)		
Gas returned from storage		0	0	0		0	0	0		0	0	0
DIST. 4—Antelope Hills	1,317	466	435	31	1,293	337	238	99	1,700	979	371	608
Ant Hill	7	5	5	0	0	0	0	0	364	7	7	0
Belridge, North	2,877	28,912	28,798	114	2,679	28,307	28,084	223	2,797	39,125	38,923	202
Temblor Gas Storage[2]		[1]625	[1]625	0		[1]634	[1]634	0		[1]623	[1]596	[1]27
Belridge, South	4,488	581	581	0	4,281	455	455	0	4,278	465	463	2
Blackwells Corner	101	20	20	0	102	19	19	0	113	20	20	0
Bowerbank Gas*		0	0	0		0	0	0		0	0	0
Buttonwillow Gas*		201	201	0		132	132	0		57	57	0
Canal	1,846	2,974	2,974	0	1,822	4,612	4,612	0	1,798	4,208	4,208	0
Canfield Ranch	1,598	1,756	1,755	1	1,675	1,811	1,796	15	1,735	1,820	1,773	47
Coles Levee, North	16,825	[1](2,901)		[1]183	16,814	[1](4,205)		[1]178	16,774	[1](2,785)		[1]354
Gas Zone*		0	0	0		0	0	0		0	0	0
Coles Levee, South	6,439	5,237	5,234	3	6,393	5,194	5,192	2	6,371	4,849	4,844	5
Gas Zone*		4,197	4,197	0		4,085	4,085	0		3,168	3,168	0
Cymric	12,571	18,615	18,312	303	12,659	17,784	17,529	255	12,367	16,712	16,528	184
Devils Den	142	25	25	0	150	37	29	8	106	27	27	0
Edison	11,848	5,323	5,162	161	11,991	5,214	5,128	86	12,004	5,542	5,419	123
Elk Hills	5,328	[1](3,649)		[1]208	7,850	[1](4,128)		[1]454	8,124	[1](3,051)		[1]445
Gas Zone*		6,589	6,589	0		7,619	7,619	0		6,700	6,700	0

Fruitvale	7,254	1,128	1,128	0	7,252	1,178	1,053	125	7,442	1,204	1,072	132
Greeley	11,183	2,639	2,636	3	11,138	2,213	2,210	3	11,154	2,947	2,917	30
Kern Bluff	1,315	0	0	0	1,431	0	0	0	1,538	0	0	0
Kern Front	6,122	603	559	44	5,824	639	595	44	5,705	603	559	44
Kern River	8,059	5	5	0	7,676	9	9	0	7,884	5	5	0
Lost Hills	5,490	4,024	3,250	774	5,481	4,270	3,292	978	5,483	4,321	3,139	1,182
McDonald Anticline	200	578	578	0	216	554	554	0	189	451	450	1
McKittrick-Temblor	2,031	1,338	1,321	17	1,975	1,310	1,264	46	2,117	1,387	1,323	64
Midway-Sunset	62,732	27,919	27,368	551	62,547	25,234	24,704	530	61,089	24,973	24,671	302
Buena Vista Gas Zone*		311	311	0		[1](12,687)				[1](15,804)		
Mount Poso	10,603	208	207	1	10,458	207	200	7	10,487	199	191	8
Mountain View	3,037	3,825	3,695	130	3,213	3,610	3,443	167	3,532	3,495	3,362	133
Paloma	14,029	52,684	51,283	1,401	15,388	55,445	54,287	1,158	16,331	59,098	58,125	973
Gas Zone*		0	0	0		0	0	0		0	0	0
Poso Creek	1,763	103	94	9	1,709	97	88	9	1,698	93	84	9
Rio Bravo	10,152	5,412	4,996	416	10,471	5,308	5,214	94	10,199	4,863	4,775	88
Round Mountain	5,992	19	19	0	6,024	19	19	0	5,998	19	19	0
Semitropic Gas*		5	5	0		3	3	0		3	3	0
Strand	941	635	627	8	862	582	569	13	885	616	610	6
Tejon	2,265	798	767	31	2,136	875	677	198	2,227	948	599	349
Tejon Hills	1,375	26	1	25	1,517	6	0	6	1,767	28	23	5
Ten Section	5,563	17,057	17,057	0	5,699	14,430	14,430	0	5,759	14,217	14,217	0
Trico Gas*		4,003	4,003	0		3,934	3,934	0		4,133	4,133	0
Wasco	180	457	350	107	164	463	378	85	154	432	360	72
Wheeler Ridge	759	244	219	25	755	242	217	25	746	243	218	25
Kern County:												
Antelope Hills Area, North									27	0	0	0
Antelope Plains Area*		29	29	0		0	0	0		0	0	0
Ant Hill Area, South	0	0	0	0	0	0	0	0	0	0	0	0
Bellevue Area	230	129	129	0	224	133	133	0	220	137	128	9
Calders Corner Area	136	241	241	0	193	293	293	0	163	239	239	0
Chico-Martinez Area	0	0	0	0	0	0	0	0	0	0	0	0
Dyer Creek Area	7	0	0	0	3	0	0	0	4	0	0	0
Jasmine Area	117	0	0	0	113	0	0	0	102	0	0	0
Los Lobos Area	2	0	0	0	1	0	0	0	0	0	0	0
McClung Area	0	0	0	0	0	0	0	0	0	0	0	0
District totals	226,924	199,321	195,166	4,155	230,180	196,660	192,484	4,176	231,431	208,333	203,730	4,603
Net gas storage		(6,550)				(21,020)				(21,643)		
Gas returned from storage		625	625	0		634	634	0		623	596	27
Dist. 5—Afton Gas*		1,277	1,277	0		945	945	0		744	744	0
Cache Slough Gas*		199	199	0		866	866	0		0	0	0
Coalinga	15,175	1,853	1,483	370	16,477	1,953	1,596	357	17,326	2,018	1,648	370
Dunnigan Hills Gas*		4,082	4,082	0		1	0	1		1	0	1
East Coalinga Extension	45,078	47,468	44,745	2,723	45,370	31,986	28,930	3,056	46,405	25,526	23,945	1,581
Eureka Gas*		3,681	3,681	0		3,529	3,529	0		2,744	2,744	0
Fairfield Knolls Gas*		977	977	0		490	490	0		284	284	0
Gill Ranch Gas*		4,572	4,572	0		0	0	0		0	0	0
Guijarral Hills	15,167	11,331	10,827	504	15,694	12,995	12,807	188	15,745	14,100	13,680	420
Helm	3,315	13,267	13,267	0	3,336	12,870	12,869	1	3,398	12,916	12,915	1

TABLE II—Continued

AVERAGE DAILY BBL. OIL, AND AVERAGE DAILY FORMATION GAS PRODUCTION AND DISPOSITION, MCF.—JANUARY 1 TO JUNE 30, 1950

Field	APRIL				MAY				JUNE			
	Oil	Gas			Oil	Gas			Oil	Gas		
	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air	Produced	Net produced	Used	Blown to air
DIST. 5—Continued												
Jacalitos	4,675	8,879	8,804	75	4,599	8,800	8,711	89	4,275	8,133	7,891	242
Kettleman Middle Dome	191	1,977	1,977	0	183	1,903	1,903	0	187	2,026	2,026	0
Kettleman North Dome	28,727	176,670	175,933	737	28,813	179,906	171,458	8,448	28,885	181,807	181,286	521
Kirby Hill Gas*		6,743	6,743	0		6,703	6,703	0		6,277	6,277	0
Lodi Gas*		1,987	1,987	0		1,798	1,798	0		1,559	1,559	0
Maine Prairie Gas*		3,489	3,489	0		3,553	3,553	0		3,571	3,571	0
Marysville Buttes Gas*		1,350	1,350	0		1,360	1,360	0		1,352	1,352	0
McDonald Island Gas*		988	988	0		3,124	3,124	0		996	996	0
Millar Gas*		1,117	1,117	0		1,611	1,611	0		751	751	0
Ord Bend Gas*		1,201	1,201	0		844	844	0		789	764	25
Pleasant Valley	2,679	1,874	1,720	154	2,801	2,246	2,043	203	2,665	2,326	2,151	175
Pyramid Hills	203	29	29	0	201	29	29	0	200	29	29	0
Raisin City	4,513	3,848	3,403	445	4,748	3,566	3,093	473	4,068	2,118	1,732	386
Rio Vista Gas*		342,751	342,747	4		357,757	357,750	7		311,267	311,264	3
Riverdale	2,400	3,914	3,896	18	2,111	3,582	3,575	7	2,133	3,694	3,675	19
Roberts Island Gas*		976	976	0		986	986	0		869	869	0
Suisun Bay Gas*		1,780	1,780	0		2,097	2,097	0		904	904	0
Thornton Gas*		5,741	5,741	0		7,056	7,056	0		5,205	5,205	0
Tracy Gas*		0	0	0		190	81	109		0	0	0
Vernalis Gas*		1,270	1,270	0		973	973	0		817	817	0
Willows Gas*		0	0	0		0	0	0		0	0	0
Winters Gas*		1,581	1,581	0		3,946	3,946	0		3,939	3,939	0
Butte County:												
Chico Area*		205	205	0		0	0	0		0	0	0
Durham Area*		1,390	1,390	0		1,403	1,403	0		843	843	0
Fresno County:												
Burrel Area	637	2,837	2,820	17	673	2,181	2,076	105	695	1,221	1,219	2
Cantua Creek Area	0	0	0	0	0	0	0	0	0	0	0	0
Cheney Ranch Area	4	90	90	0	4	101	101	0	4	91	91	0
Kreyenhagen Area	0	0	0	0	0	0	0	0	0	0	0	0
San Joaquin Area	199	86	24	62	265	93	31	62	287	103	35	68
Kings County: Trico Area, Northwest*		480	480	0		460	460	0		465	465	0
Madera County:												
Chowchilla Area*		0	0	0		0	0	0		0	0	0
Moffatt Ranch Area*		937	937	0		1,043	1,043	0		913	913	0

San Joaquin County: Galt Area*		259	259	0		273	273	0		263	263	0
Solano County: Denverton Area*		386	386	0		333	333	0		254	254	0
Sonoma County:												
Petaluma Area	1	0	0	0	8	0	0	0	5	0	0	0
Gas Zone*		0	0	0		0	0	0		0	0	0
Tehama County: Corning Area*		0	0	0		0	0	0		0	0	0
Yolo County: Pleasant Creek Area*		0	0	0		0	0	0		0	0	0
District totals	122,954	663,542	658,433	5,109	125,283	663,552	650,446	13,106	126,278	600,915	597,101	3,814
Net gas storage		0				0				0		
Gas returned from storage		0	0	0		0	0	0		0	0	0
Grand totals	864,172	1,418,810	1,396,981	21,829	880,741	1,424,174	1,390,526	33,648	892,342	1,391,583	1,365,962	25,621
Net gas storage		(10,593)				(49,706)				(54,393)		
Gas returned from storage		6,136	6,136	0		3,030	3,030	0		2,899	2,872	27

* Dry gas wells.

[1] Considered to be returned from or delivered to storage.

Parentheses indicate negative figures due to storage. All figures are net; carried to separate totals.

Gas blown when there was net storage was replaced by gas from other sources, and is not included in totals because already accounted for at the field of origin.

[2] Oil produced from the Temblor zone is included with that shown in North Belridge.

TABLE III

NATURAL GAS RESERVES, MCF.

Field	Gas reserves Jan. 1, 1950	Gas injected January to June 1950	Gross gas withdrawn January to June 1950	Net gas withdrawn January to June 1950	Gas reserves July 1, 1950
DIST. 1—Aliso Canyon	62,082,605	0	535,609	535,609	61,546,996
Beverly Hills*		0	1,883	1,883	
Brea-Olinda	34,240,505	0	1,595,736	1,595,736	32,644,769
Coyote, East	10,372,773	0	561,949	561,949	9,810,824
Coyote, West	52,269,145	[5]8,562,616	7,778,235	2,215,619	50,053,526
Del Valle	26,964,114	0	2,113,275	2,113,275	24,850,839
Dominguez	18,639,376	0	3,227,363	3,227,363	15,412,013
El Segundo	300,000	0	28,677	28,677	271,323
Gas Zone	9,061,214	340,458	145,902	[2](194,556)	9,255,770
Huntington Beach	47,997,262	109,201	7,569,887	7,460,686	40,536,576
Inglewood	10,477,414	0	1,800,985	1,800,985	8,676,429
Lawndale	4,015,392	0	69,742	69,742	3,945,650
Long Beach	61,377,463	0	3,619,029	3,619,029	57,758,434
Los Angeles City*		0	0	0	
Los Angeles, East	7,297,510	0	425,389	425,389	6,872,121
Montebello	22,993,465	0	1,367,143	1,367,143	21,626,322
Newhall*		0	9,891	9,891	
Newhall-Potrero	143,131,607	5,062,834	5,949,657	886,823	142,244,784
Newport*		0	0	0	
Newport, West	7,950,356	4,990	196,966	191,976	7,758,380
Gas Zone*		0	0	0	
Oak Canyon	24,830,027	0	370,597	370,597	24,459,430
Placerita*		0	[3]762,931	[3]762,931	
Playa del Rey	3,118,896	0	339,101	339,101	2,779,795
Del Rey Hills Gas Storage	[4]4,036,358	1,076,842	1,707,337	630,495	[3]3,405,863
Potrero	5,105,560	0	3,423,858	3,423,858	1,681,702
Richfield	14,443,064	0	926,174	926,174	13,516,890
Rosecrans	19,636,799	68,810	2,891,276	2,822,466	16,814,333
Salt Lake*		0	0	0	
Santa Fe Springs	39,604,904	1,022	2,432,229	2,431,207	37,173,697
Seal Beach	10,553,422	0	1,945,064	1,945,064	8,608,358
Torrance	11,719,896	0	759,518	759,518	10,960,378
Turnbull	107,453	0	12,546	12,546	94,907
Whittier	1,364,697	0	173,967	173,967	1,190,730
Wilmington	250,576,826	0	21,584,598	21,584,598	228,992,228
Los Angeles County:					
Alondra Area	3,923,008	0	39,172	39,172	3,883,836
Castaic Area*		0	761	761	
East Dominguez Area*		0	5,688	5,688	
Hyperion Area*		0	1,111	1,111	
Leffingwell Area*		0	5,297	5,297	
Puente Area*		0	0	0	
Northwest Rosecrans Area*		0	0	0	
Simi Area*		0	0	0	
Whittier Heights Area*		0	0	0	
Orange County:					
Buena Park Area*		0	895	895	
Talbert Area*		0	0	0	
San Bernardino County:					
Chino-Mahala Area*		0	0	0	
District totals:					
Fields with estimated reserves	908,191,111	12,226,773	73,590,981	61,364,208	846,826,903
Fields with no reserves estimated*		0	788,457	788,457	
DIST. 2—Bardsdale	6,516,330	0	1,008,361	1,008,361	5,507,969
Montalvo, West*		0	259,744	259,744	
Ojai*		0	10,890	10,890	
Oxnard*		0	4,076	4,076	
Piru*		0	134,199	134,199	
Ramona*		0	[1]1,122,465	[1]1,122,465	
Rincon	101,449,212	0	5,451,256	5,451,256	95,997,956
Santa Paula*		0	2,305	2,305	
Sespe*		0	7,307	7,307	
Simi*		0	600	600	
South Mountain	15,495,581	0	1,907,601	1,907,601	13,587,980
Temescal*		0	85,839	85,839	
Ventura	608,457,344	0	19,415,728	19,415,728	589,041,616
Ventura County:					
South Tapo Canyon Area*		0	0	0	
District totals:					
Fields with estimated reserves	731,918,467	0	27,782,946	27,782,946	704,135,521
Fields with no reserves estimated*		0	1,627,425	1,627,425	

TABLE III—Continued

NATURAL GAS RESERVES, MCF.

Field	Gas reserves Jan. 1, 1950	Gas injected January to June 1950	Gross gas withdrawn January to June 1950	Net gas withdrawn January to June 1950	Gas reserves July 1, 1950
Dist. 3—Arroyo Grande*		0	2,700	2,700	
Capitan	3,146,296	19,881	440,426	420,545	2,725,751
Casmalia*		0	62,205	62,205	
Cat Canyon	15,823,673	0	725,981	725,981	15,097,692
Elwood	6,741,756	0	938,326	938,326	5,803,430
La Goleta Gas	42,950,497	2,893,996	7,547,660	4,653,664	38,296,833
Lompoc	8,962,517	0	14,137	14,137	8,948,380
Mesa*		0	0	0	
Moody Gulch*		0	0	0	
Morales*		0	25,909	25,909	
Orcutt	5,142,034	0	1,253,445	1,253,445	3,888,589
Russell Ranch	76,339,586	1,430,355	2,897,704	1,467,349	74,872,237
San Ardo*		0	600	600	
Santa Maria Valley	16,431,716	0	5,040,890	5,040,890	11,390,826
South Cuyama	279,070,727	529,955	1,627,915	1,097,960	277,972,767
Summerland*		0	0	0	
Gas Zone*		0	116,436	116,436	
Zaca*		0	0	0	
Monterey County*		0	0	0	
San Benito County*		0	0	0	
San Luis Obispo County:					
Guadalupe Area*		0	364	364	
Santa Barbara County*		0	0	0	
District totals:					
Fields with estimated reserves	454,608,802	4,874,187	20,486,484	15,612,297	438,996,505
Fields with no reserves estimated*		0	208,214	208,214	
Dist. 4—Antelope Hills	6,482,951	0	98,704	98,704	6,384,247
Ant Hill	49,709	0	2,242	2,242	47,467
Belridge, North:					
Shallow Zone	52,689	0	9,386	9,386	43,303
Temblor Zone	[1]24,945,341	489,017	109,368	[2](379,649)	[1]25,324,990
R Zone	56,526,623	0	4,420,511	4,420,511	52,106,112
64 Zone	57,681,523	2,833,557	4,823,286	1,989,729	55,691,794
Y Zone	3,951,496	354,564	583,777	229,213	3,722,283
Belridge, South	311,444	0	88,250	88,250	223,194
Blackwells Corner	235,600	0	3,600	3,600	232,000
Bowerbank Gas	33,574,842	0	32,863	32,863	33,541,979
Buttonwillow Gas	57,635	0	31,244	31,244	26,391
Canal	34,670,734	1,999,509	2,633,746	634,237	34,036,497
Canfield Ranch	1,120,260	0	325,053	325,053	795,207
Coles Levee, North	368,577,240	9,230,649	8,603,010	[2](627,639)	369,204,879
Gas Zone	5,901,539	0	357,046	357,046	5,544,493
Coles Levee, South	555,123,137	11,352,484	12,359,680	1,007,196	554,115,941
Gas Zone	2,239,686	0	823,482	823,482	1,416,204
Cymric					
Upper Zone*		462,981	776,239	313,258	
Oceanic Zone	13,732,836	0	2,268,920	2,268,920	11,463,916
Point of Rocks Zone	7,883,496	0	962,407	962,407	6,921,089
Devils Den*		0	4,392	4,392	
Edison	4,420,432	0	983,006	983,006	3,437,426
Elk Hills, All Zones	586,523,203	1,038,110	1,673,711	†1,075,416	585,887,602
Gas Zone		0	†1,075,416	†1,075,416	
Upper Zone		†1,038,110	†212,633	[2]†(825,477)	
Stevens Zone		0	†385,662	†385,662	
Fruitvale	1,567,571	0	205,697	205,697	1,361,874
Greeley	113,358,264	2,050,893	2,540,011	489,118	112,869,146
Kern Bluff*		0	0	0	
Kern Front	3,760,188	0	116,557	116,557	3,643,631
Kern River	46,612	0	1,381	1,381	45,231
Lost Hills	3,092,323	0	747,487	747,487	2,344,836
McDonald Anticline*		0	90,131	90,131	
McKittrick-Temblor*		0	246,297	246,297	
Midway-Sunset	60,571,722	2,174,458	7,089,982	4,915,524	55,656,198
Buena Vista Gas Zone	6,296,191	882,646	274,467	[2](608,179)	6,904,370
Mount Poso	[3]420,000	0	38,466	38,466	381,534
Mountain View	[3]4,800,000	0	684,568	684,568	4,115,432
Paloma, All Zones	602,387,429	14,156,781	24,030,613	9,873,832	592,513,597
Gas Zone		0	0	0	
Symons Zone		0	†306,019	†306,019	
Paloma Zone		†14,156,781	†23,724,594	†9,567,813	
Poso Creek	205,530	0	17,848	17,848	187,682
Rio Bravo	149,396,562	2,364,341	3,324,782	960,441	148,436,121
Round Mountain	83,853	0	3,361	3,361	80,492

TABLE III—Continued

NATURAL GAS RESERVES, MCF.

Field	Gas reserves Jan. 1, 1950	Gas injected January to June 1950	Gross gas withdrawn January to June 1950	Net gas withdrawn January to June 1950	Gas reserves July 1, 1950
DIST. 4—Continued					
Semitropic Gas	10,052,227	0	50,370	50,370	10,001,857
Strand	9,845,621	0	70,399	70,399	9,775,222
East Area	3,774,362	0	42,218	42,218	3,732,144
Tejon	799,457	0	154,897	154,897	644,560
Tejon Hills*		0	6,219	6,219	
Ten Section	82,632,985	0	3,098,844	3,098,844	79,534,141
Trico Gas	199,573,900	0	2,894,353	2,894,353	196,679,547
Wasco	[3]840,000	0	97,955	97,955	742,045
Wheeler Ridge	[3]420,000	0	43,990	43,990	376,010
Kern County:					
Antelope Hills Area, North*		0	0	0	
Antelope Plains Area*		0	4,721	4,721	
Ant Hill Area, South*		0	0	0	
Bellevue Area*	205,200	0	25,540	25,540	179,660
Calders Corner Area*		0	48,641	48,641	
Chico-Martinez Area*		0	0	0	
Dyer Creek Area*		0	0	0	
Jasmine Area*		0	0	0	
Los Lobos Area*		0	0	0	
McClung Area	3,500	0	0	0	3,500
District totals:					
Fields with estimated reserves	3,018,195,913	48,927,009	86,747,078	37,820,069	2,980,375,844
Fields with no reserves estimated*		462,981	1,176,640	713,659	
DIST. 5—Afton Gas*		0	285,177	285,177	
Cache Slough Gas*		0	557,291	557,291	
Coalinga*		0	375,473	375,473	
Dunnigan Hills Gas*		0	492,595	492,595	
East Coalinga Extension	463,859,561	1,661,478	9,810,916	8,149,438	455,710,123
Eureka Gas	27,309,084	0	724,079	724,079	26,585,005
Fairfield Knolls Gas*		0	141,176	141,176	
Gill Ranch Gas	26,948,206	0	1,497,433	1,497,433	25,450,773
Guijarral Hills*		0	2,068,368	2,068,368	
Helm	190,984,024	0	2,423,058	2,423,058	188,560,966
Jacalitos	[3]38,697,397	0	1,568,586	1,568,586	37,128,811
Kettleman Middle Dome*		0	358,975	358,975	
Kettleman North Dome	1,554,698,307	19,491,748	53,332,086	33,840,338	1,520,857,969
Kirby Hill Gas	31,449,889	0	1,497,183	1,497,183	29,952,706
Lodi Gas	13,481,237	0	386,334	386,334	13,094,903
Maine Prairie Gas*		0	693,370	693,370	
Marysville Buttes Gas	15,458,207	0	250,588	250,588	15,207,619
McDonald Island Gas	84,733,595	0	2,565,797	2,565,797	82,167,798
Millar Gas*		0	537,636	537,636	
Ord Bend Gas*		0	256,473	256,473	
Pleasant Valley	15,637,236	0	428,286	428,286	15,208,950
Pyramid Hills*		0	5,243	5,243	
Raisin City	3,799,787	0	477,139	477,139	3,322,648
Rio Vista Gas	1,891,632,253	0	71,820,316	71,820,316	1,819,811,937
Riverdale	24,654,502	0	689,385	689,385	23,965,117
Roberts Island Gas*		0	175,976	175,976	
Suisun Bay Gas*		0	1,103,670	1,103,670	
Thornton Gas	17,035,976	0	1,756,819	1,756,819	15,279,157
Tracy Gas	10,120,810	0	314,218	314,218	9,806,592
Vernalis Gas	5,440,334	0	213,410	213,410	5,226,924
Willows Gas*		0	0	0	
Winters Gas*		0	690,354	690,354	
Butte County:					
Chico Area*		0	52,601	52,601	
Durham Area*		0	331,812	331,812	
Fresno County:					
Burrel Area*		0	226,931	226,931	
Cantua Creek Area*		0	0	0	
Cheney Ranch Area*		0	19,214	19,214	
Kreyenhagen Area*		0	0	0	
San Joaquin Area*		0	17,253	17,253	
Kings County:					
Trico Area, Northwest*		0	88,022	88,022	
Madera County:					
Chowchilla Area	20,051,000	0	0	0	20,051,000
Moffatt Ranch Area*		0	137,275	137,275	
San Joaquin County:					
Galt Area*		0	71,194	71,194	

TABLE III—Continued

NATURAL GAS RESERVES, MCF.

Field	Gas reserves Jan. 1, 1950	Gas injected January to June 1950	Gross gas withdrawn January to June 1950	Net gas withdrawn January to June 1950	Gas reserves July 1, 1950
Dist. 5—Continued					
Solano County:					
Denverton Area*		0	62,854	62,854	
Sonoma County:					
Petaluma Area*		0	0	0	
Gas Zone*		0	0	0	
Tehama County:					
Corning Area*		0	0	0	
Yolo County:					
Pleasant Creek Area*		0	0	0	
District totals:					
Fields with estimated reserves	4,435,991,405	21,153,226	149,755,633	128,602,407	4,307,388,998
Fields with no reserves estimated*		0	8,748,933	8,748,933	
Grand totals:					
Fields with estimated reserves	9,548,905,698	87,181,195	358,363,122	271,181,927	9,277,723,771
Fields with no reserves estimated*		462,981	12,549,669	12,086,688	

* No reserves estimated because of lack of data, or because they are insufficient to justify pipe line connections to marketing system for domestic or industrial consumption. Figures are carried to separate totals.

† Not included in total.

[1] Storage only.

[2] Net storage. Parentheses indicate negative figure.

[3] Estimated figure.

[4] Includes 374,737 Mcf. produced in Los Angeles County portion of Ramona field.

[5] Reestimate.

COLLECTION OF FUNDS BY ASSESSMENT AND FINANCIAL STATEMENT

The following report is made in accordance with Section 3108, Division III, Public Resources Code, which reads as follows:

"On or before the first day of October of each year the supervisor shall make public, for the benefit of all interested persons, a report in writing showing:

(a) The total amounts of oil and gas produced in each county in the State during the previous calendar year.

(b) The total cost of the division for the previous fiscal year.

(c) The net amount remaining in the petroleum and gas fund available for the expenses of the succeeding fiscal year.

(d) The total amount delinquent and uncollected from any assessments or charges levied pursuant to this chapter.

The report shall also include such other information as the supervisor deems advisable."

COLLECTION OF FUNDS BY ASSESSMENT

Funds for the support of the Division of Oil and Gas are raised by the assessment of a special tax against the oil industry as provided for in Division III, Public Resources Code. The rate of assessment is determined in accordance with Sections 3402, 3403, 3404, 3410 and 3411 of the statutes mentioned. The amount of money to be raised annually as provided in Sections 3410 and 3411 is sufficient for the support of the Division of Oil and Gas, and to provide for a surplus of $50,000. The amount for 1950 is $376,775.00

The assessment is levied upon the oil produced and the gas produced and sold in the calendar year just preceding the year in which the tax is levied. For the purpose of this assessment, 10,000 cubic feet of gas is considered equal to one barrel of oil. The rate applied in levying the total assessment is $0.0010096 per barrel of oil or per 10,000 cubic feet of gas.

The amounts of oil produced and gas produced and sold in 1949 in the various counties of the State are reported and summarized as follows:

County	*Non-assessable*	*Oil produced (bbl) (includes exempt)*	*Gas produced & sold (10 MCF) (includes exempt)*
Butte	----	----	21,648
Contra Costa	----	----	295,034
Fresno	----	43,953,939	6,044,342
Glenn	----	----	160,427
Humboldt	----	----	130,345
Imperial	----	----	* 13,526
Kern	847,373	94,745,210	4,916,069
Kings	----	5,169,506	2,698,303
Los Angeles	53,248	93,790,659	4,352,245
Madera	----	----	277,843
Monterey	----	480,984	----
Orange	----	37,277,519	1,612,643
Sacramento	----	----	6,267,086
San Benito	----	1,547	----
San Bernardino	----	1,485	----
San Joaquin	----	----	634,130
San Luis Obispo	----	2,723,491	412
Santa Barbara	----	24,055,230	894,243
Santa Clara	----	421	----
Solano	----	726	5,323,884
Sonoma	----	1,188	----
Stanislaus	----	----	6,237
Sutter	----	----	61,406
Tulare	----	----	532,513
Ventura	----	34,046,481	3,483,694
Yolo	----	----	27,414
Actual Production	900,621	336,248,386	37,753,444
Less: Non-Assessable		—900,598	—23
Plus: Penalties Levied (Sec. 3409)		114,914	----
Grand Totals, Assessable		335,462,702	37,753,421

* Carbon dioxide.

FINANCIAL STATEMENT—PETROLEUM AND GAS FUND

49-50 Fiscal Year
July 1, 1949 to June 30, 1950

Disbursements

Support FY 49-50:			
Salaries and wages		$245,039.89	
Operating expenses		70,377.19	
Equipment		12,183.28	
Total		$327,600.36	
Less: Employees Maintenance deductions		704.00	
Total support		$326,896.36	
Transfers to Employees' Retirement System		17,101.53	
Total			$343,997.89
Capital Outlay—Improvements FY 49-50:			
Repairs to Taft Office Bldg.	$1,726.64		
Repairs & Addns. to Coalinga Office Bldg.	2,599.45		
Total capital outlay 49-50			4,326.09
Prior Years:			
48-49 support	$31,707.25		
Less: Employees maintenance	64.00		
		$31,643.25	
Contributions to Retirement System		3,374.46	
Capital-outlay—improvements		----	
Total FY 48-49		$35,017.71	
Capital outlay 96th FY-return on PWO#1178		—10,059.00	
			24,958.71
Balance in Treasury 6/30/49		$152,274.36	
Less: Claims outstanding		53.98	
Balance in Petroleum and Gas Fund			152,220.38
Total disbursements			$525,503.07

Receipts

Balance in Treasury 6/30/49		$94,295.14	
Less: Claims outstanding as of 6/30/49		3,369.68	
Balance in Fund 6/30/49			90,925.46
Receipts from assessments and penalties 1949	$429,627.37		
Net publication—sales	4,950.24		
			434,577.61
Total receipts			$525,503.07

List of the Delinquent Assessments and Penalties as of June 30, 1950

Year	*Amount*
1947	$40.10
1948	36.05
1949	93.50
Total	$169.65

REPORTS ISSUED BY STATE OIL AND GAS SUPERVISOR DURING MONTHS OF JANUARY TO JUNE, 1949, INCLUSIVE

The accompanying tables show the number and kind of reports issued by the State Oil and Gas Supervisor to oil operators in each field of the State of California during each of the above months.

Reports by the Supervisor are of two kinds, namely, those passing upon proposed operations and those passing upon work which has been inspected or tests which have been witnessed by a representative of the Supervisor during the progress of the work or after completion.

The State is divided into five districts, as follows:

District No. 1, including the counties of Los Angeles, Riverside, Orange, San Diego, Imperial, and San Bernardino.

District No. 2, the county of Ventura.

District No. 3, including the counties of Santa Barbara, San Luis Obispo, Monterey, Santa Cruz, San Benito, Santa Clara, Contra Costa, San Mateo, Alameda, and San Francisco.

District No. 4, including the counties of Tulare, Inyo, and Kern.

District No. 5, including the counties of Fresno, Madera, Kings, Mono, Mariposa, Merced, and all other counties in California not included in any of said other districts.

Field offices are maintained in District No. 1 at Los Angeles, with branch field office at Long Beach.

In Districts No. 2, No. 3, and No. 5, the field offices are at Santa Paula, Santa Maria, and Coalinga, respectively.

In District No. 4 the main field office is at Bakersfield, with a branch field office at Taft.

MONTH OF JANUARY, 1950

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 1—Aliso Canyon	1	1				
Brea-Olinda	1	2				
Del Valle	2				1	
Dominguez	1	1				
East Coyote	2	2			1	
East Los Angeles	2					
Huntington Beach	6	8		3	1	
Imperial Carbon Dioxide Gas		2				
Long Beach	5		4	6		
Montebello	3	1		1		
Newhall	1			2	2	
Newhall-Potrero	2			2		
Placerita	13	10		12	2	
Ramona	1					
Richfield	5	1		2		
Santa Fe Springs	5			4		
Seal Beach	4			2		
Torrance	4				1	
West Newport					1	
Whittier	1	2				
Wilmington	15	14		15	2	
Los Angeles County	4	3	1	2	2	
Orange County	2	2			2	
Riverside		3				
San Bernardino County		2				
Totals	80	54	5	51	15	
DIST. 2—Bardsdale	1	1				
Ojai		1				
Piru		1		1		
Rincon	10	5		1		
Simi	2				1	
South Mountain		1				
Ventura	7	7		3		
West Montalvo	1				1	
Ventura County	1	3			3	
Totals	22	19		5	5	
DIST. 3—Capitan	2			3		
Casmalia	1					
Cat Canyon	2	1		1		
Elwood	4	1				1
La Goleta Gas					2	
Mesa	3					
Russell Ranch	4	3		1	1	
Santa Maria Valley	1					
South Cuyama	12	9				
Contra Costa County					1	
Monterey County					2	
San Luis Obispo County	1	1			3	
Santa Barbara County	1	3		1	2	
Totals	31	18		6	11	1
DIST. 4—Canfield Ranch	1					
Cymric	3	1			4	
Devils Den	5	1		1	1	
Edison	2	2	2	1		1
Elk Hills	12	2		1	3	
Fruitvale	4	3		2		
Greeley					1	
Kern Front		1			1	
Kern River					1	
Lost Hills	1					
McKittrick	4	3	1			
Midway	4	2		3	3	
Mt. Poso					1	
Mountain View	2	1		4		
North Coles Levee		1				
Paloma	6	1		1		
Poso Creek	1			1		
Round Mountain					1	
Semitropic Gas					1	

MONTH OF JANUARY, 1950—Continued

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 4—Continued						
South Belridge	6	7				
Sunset	5	1		2		
Tejon	1	1				
Tejon Hills	1	4			1	
Wheeler Ridge				1		
Kern County	2	3			5	
Tulare County		1				
Totals	60	35	3	17	23	1
DIST. 5—Coalinga	4				4	
East Coalinga Extension				2		
Guijarral Hills	13	3				
Helm				1		
Jacalitos	2					
Kettleman North Dome	2			2		
Pyramid Hills	1					
Raisin City	2	5		1	1	
Rio Vista Gas	1					
Riverdale	1			1	1	
Fresno County	4	4			2	
Humboldt County					1	
Kings County		4			1	
Madera County		1				
Yolo County					1	
Totals	30	17		7	11	
Grand totals	223	143	8	86	65	2

[1] Wells not in proved oil fields are designated by county only.

MONTH OF FEBRUARY, 1950

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 1—Aliso Canyon	2			1		
Brea-Olinda		1	1			
Del Valle	1	1	1			
Dominguez	2			4		
East Coyote	3	1	1		1	
East Los Angeles	1	1				
Huntington Beach	8	2	1		1	
Inglewood	4	1				
Long Beach	8	2		9		
Montebello	3	1				
Newhall-Potrero	1	1				
Placerita	10	5		6	1	
Ramona		1		1		
Richfield		2		1		
Santa Fe Springs	5	1		3		
Seal Beach	5	1				
Torrance	1	1			3	
West Coyote				1		
West Newport	2				4	
Wilmington	14	17	2	7		
Los Angeles County	8	5	2		3	
Orange County	2	1			1	
Riverside County		1			1	
San Bernardino County	2			3	2	
Totals	82	46	8	36	17	
DIST. 2—Bardsdale	1					
Ojai	1		1		1	
Rincon	4			1		
Santa Paula		1				
Sespe	1	1			2	
Simi	1	1			1	
South Mountain		1				
Ventura	8	2	1	3	1	
Ventura County		1			1	
Totals	16	7	2	4	6	
DIST. 3—Elwood	6					3
Russell Ranch	4	4	1	1	2	
South Cuyama	12	13	1			
Contra Costa County					1	
Monterey County					1	
San Benito County		1				
San Luis Obispo County		5			2	
Santa Barbara County		2			3	
Santa Cruz County			1			
Totals	22	25	3	1	9	3
DIST. 4—Cymric	1		1			
Devils Den	1					
Edison	7	6	1	1	3	
Elk Hills	8	2		1	3	
Fruitvale	4	3	1		1	
Kern Front	1			1		
Kern River				1	1	
Lost Hills	1	2				
McKittrick	2			1	2	
Midway	4	2		3	2	
Mountain View	5	1		2		
North Coles Levee	1					
Paloma	2	1				
Poso Creek					1	
Rio Bravo	1			1		
Round Mountain	2				1	
South Belridge	3	6				
Sunset	6	3		2	1	
Tejon	1					
Tejon Hills	2	10		2	1	
Kern County	2	7			7	
Totals	54	43	3	15	23	

MONTH OF FEBRUARY, 1950—Continued

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
Dist. 5—Coalinga	5				1	
East Coalinga Extension		1				
Guijarral Hills	7	5	1			
Jacalitos	2		1	1		
Kettleman North Dome	1			1		
Kettleman Middle Dome				2		
Raisin City	5	1		1		
Rio Vista Gas	1	2	1			
Fresno County		4			4	
Humboldt County					1	
Kings County	1		1		1	
Madera County					1	
Totals	22	13	4	5	8	
Grand totals	196	134	20	61	63	3

[1] Wells not in proved oil fields are designated by county only.

MONTH OF MARCH, 1950

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
Dist. 1—Aliso Canyon	2	1				
Brea-Olinda	1					
Dominguez	5	1		3		
East Coyote	1	1			1	
East Los Angeles	1			1		
Huntington Beach	23	8		1	3	
Imperial Carbon Dioxide Gas		2				
Inglewood	1	3				
Long Beach	18			4	2	2
Montebello	5		1		1	
Newhall	3	1				
Newhall-Potrero	2					
Oak Canyon		1				
Placerita	7	11	1	3		
Playa del Rey				1		
Potrero	1			1		
Ramona	1	1				
Richfield	5	1				
Rosecrans	1			2	1	
Santa Fe Springs				6		
Seal Beach	2	2				
Torrance	6			1		
West Coyote	1					
West Newport	12				1	
Whittier	1	1				
Wilmington	32	18	2	22		
Los Angeles County	16	3			4	
Orange County	3	2			1	
Riverside County	2	1		2	3	
San Bernardino County	2	1				
San Diego County					1	
Totals	154	59	4	47	18	2
Dist. 2—Bardsdale		3				
Conejo					2	
Rincon	2			2		
Santa Paula	1					
Sespe	2	1				
South Mountain	3	2				
Ventura	3			1	1	
West Montalvo		1				
Ventura County	3	2			1	
Totals	14	9		3	4	
Dist. 3—Cat Canyon	2				1	
Elwood	6					
La Goleta Gas		1				
Morales	1	1				
Russell Ranch	3	3		1		
South Cuyama	16	11		1		
Contra Costa County		2				
Monterey County		1				
San Benito County		1				
San Luis Obispo County		1		1	2	
Santa Barbara County		1			2	
Totals	28	22		3	5	
Dist. 4—Canfield Ranch		1				
Cymric	3	1		6		
Devils Den	2	2				
Edison	8	3	2			
Elk Hills	10	3			6	1
Fruitvale	3					
Greeley	1				1	
Kern River	2	1			2	
McDonald Anticline		1			1	
Midway	3	4		3	2	
Mt. Poso	2			1	1	
Mountain View	6	3	1	5		
North Coles Levee	1					
Paloma	3	2				
Poso Creek	1					

MONTH OF MARCH, 1950—Continued

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 4—Continued						
Rio Bravo		2				
Round Mountain		1			1	
Semitropic Gas	1				1	
South Belridge	10	9		1		
Strand	1				1	
Sunset	10	2	2	1	4	
Tejon			1	1	1	
Tejon Hills	8	6	1	2	5	
Trico Gas	2		1			
Kern County	1	9	2	1	7	
Totals	78	50	10	21	33	1
DIST. 5—Coalinga	6				2	
East Coalinga Extension	1					
Guijarral Hills	7	1	1		1	
Helm				1	1	
Jacalitos	2	1		1	1	
Kettleman North Dome	1			6		
Raisin City	2	2	1			
Rio Vista Gas	1	2	1			
Riverdale					1	1
Fresno County	1	5		1	3	1
Kings County					1	
Solano County		2				
Sonoma County		1				
Tehama County		2				
Yolo		1			1	
Totals	21	17	3	9	11	2
Grand totals	295	157	17	83	71	5

[1] Wells not in proved oil fields are designated by county only.

MONTH OF APRIL, 1950

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 1—Aliso Canyon				1	1	
Brea-Olinda		1		1		
Del Valle	2	1	1	1		
Dominguez	4			1		
East Coyote	2			1		
East Los Angeles		1				
Huntington Beach	18	6		2	2	1
Imperial Carbon Dioxide Gas		2				
Inglewood	1	1		2	1	
Long Beach	6	2	1	3		
Montebello	1	1		1		
Newhall	2	1			1	
Newhall-Potrero	3			1		
Oak Canyon	1					
Placerita	9	2		4	1	
Playa Del Rey					1	
Potrero				1		
Ramona	3					
Richfield	3	1	1			
Rosecrans	2	1				
Santa Fe Springs	7	1		3		
Seal Beach	6	4		6		
Torrance	6	1			1	
West Coyote	2	1				
West Newport		1				
Whittier	1	1				
Wilmington	20	19	1	18		
Imperial County					1	
Los Angeles County	5	4			2	
Orange County	2	1				
Riverside County					1	
San Bernardino County		1				
Totals	106	54	4	46	12	1
DIST. 2—Bardsdale	1					1
Ojai	1					
Piru	1					
Rincon	11			2		
Sespe	2				1	
South Mountain	1					
Ventura	9	7		6		
West Montalvo	1					
Ventura County	2	1				
Totals	29	8		8	1	1
DIST. 3—Arroyo Grande		2			1	
Cat Canyon		2				
Elwood	3			2		
La Goleta Gas		1				
Morales	1	2				
Orcutt		1				
Russell Ranch	2	1		2		
South Cuyama	10	6	1	1		
Contra Costa County					1	
San Benito County	1	1			1	
San Luis Obispo County		3			3	
Santa Barbara County		3			3	1
Totals	17	22	1	5	9	1
DIST. 4—Canfield Ranch	1					
Cymric	6			4		
Edison	7			1		1
Elk Hills	3	3	1		3	
Fruitvale	2			5		
Kern River					1	
Lost Hills	1		1			
McKittrick		1				
Midway	4	2		1		
Mountain View	6	1		4	3	
Paloma	3	2				
Rio Bravo					1	
Round Mountain		1			1	

MONTH OF APRIL, 1950—Continued

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 4—Continued						
South Belridge	2					
Strand	1			1		
Sunset	8	3			1	
Tejon	4		1	1		
Tejon Hills	6	7		2	1	
Ten Section				1		
Kern County	5	8	1	1	10	
Totals	59	28	4	21	21	1
DIST. 5—Coalinga	3	1		3	2	
East Coalinga Extension	1	1		1		
Guijarral Hills	2	1				
Helm				2	1	
Jacalitas	1	1				
Kettleman North Dome	1			3		
Raisin City	3	3		1		1
Rio Vista Gas	1	1				
Tracy Gas				1		
Colusa County		1				
Fresno County		2	1		1	
Kings County		1				
Sacramento County		1				
Solano County	1		1			
Sonoma County	1					
Totals	14	13	2	11	4	1
Grand totals	225	125	11	91	47	5

[1] Wells not in proved oil fields are designated by county only.

MONTH OF MAY, 1950

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 1—Aliso Canyon	4					
Beverly Hills	1				1	
Brea-Olinda	1	1				
Del Valle		1				
Dominguez	2	2		3		
East Coyote	1	2				
East Los Angeles	1	1				
Huntington Beach	10	7		1		
Inglewood	9	4				
Long Beach	9	6		8		1
Montebello	3			1		
Newhall	1	1				
Newhall-Potrero	2	2				
Oak Canyon			1			
Placerita	3	4		1		
Richfield	1	3		2		
Rosecrans	4			1	2	
Santa Fe Springs	5	1		1	1	
Seal Beach	5			5		
Torrance	8	1				3
Turnbull				1		
West Newport	1					
Wilmington	34	20	1	28	1	
Los Angeles County	7	3	1	2	7	
Orange County	4	2			1	
Riverside County				1		
San Bernardino County	4			2	1	
Totals	120	61	3	57	14	4
DIST. 2—Bardsdale					1	
Rincon	2	2		4		
Sespe	1					
South Mountain	2	2				
Ventura	15	7		3	1	
Ventura County	1	1			2	
Totals	21	12		7	4	
DIST. 3—Arroyo Grande		1				
Cat Canyon					1	
Elwood	3			2		
La Goleta Gas					2	
Morales	1	5				
Orcutt	1					
Russell Ranch	2					
San Ardo		1				
Santa Maria Valley				1		
South Cuyama	9	11				
Monterey County		1				
San Benito County	1	1			2	
San Luis Obispo County		5			4	
Santa Barbara County		1			2	
Totals	17	26		3	11	
DIST. 4—Canfield Ranch	1	1		1		
Cymric				3	1	
Edison	5	9		2	1	
Elk Hills	12	2			4	
Fruitvale	4	1		2		
Lost Hills		1			1	
McKittrick	2	1			1	
Midway	5	4		1		
Mt. Poso		1			1	
Mountain View	15	2	2	3		
Paloma	4	1				
Poso Creek	2			1		
South Belridge	7	8				
South Coles Levee				1		
Strand	2					
Sunset	4			2	4	
Tejon	1					
Tejon Hills	9	8			2	
Kern County	8	11	1	1	13	
Tulare County		2			2	
Totals	81	52	3	17	30	

MONTH OF MAY, 1950—Continued

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 5—Coalinga	6	3			1	
Dunnigan Hills Gas		1			1	
East Coalinga Extension				1		
Guijarral Hills	2		2			
Helm				1		
Kettleman North Dome	2			4		
Kettleman Middle Dome	1			2		
Raisin City	4	2				
Rio Vista Gas	1	1			1	
Riverdale				1		
Colusa County		1			1	
Fresno County	1					
Kings County		2			1	
Merced County		1				
Sacramento County	1					
Solano County	2					
Stanislaus County		1				
Tehama County	2	1				
Totals	22	13	2	9	5	
Grand totals	261	164	8	93	64	4

[1] Wells not in proved oil fields are designated by county only.

MONTH OF JUNE, 1950

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 1—Aliso Canyon				1		
Brea-Olinda		2				
Del Valle	1		1			
Dominguez	5			2	2	
East Coyote	1					
East Los Angeles	2					
Huntington Beach	8	6	1	1	1	
Imperial Carbon Dioxide Gas					3	
Inglewood	12	4				
Long Beach	36	21	2	29	3	
Los Angeles City	2				2	
Montebello	2					
Newhall	4	1			2	
Newhall-Potrero	2					
Placerita	7	9		4	2	
Richfield	4	2		2		
Rosecrans	2			1	1	
Santa Fe Springs	7	3		6		
Seal Beach	4	1		1		
Torrance	3			2	2	
Turnbull					1	
West Coyote	2	4				
Whittier	1	1				
Wilmington	41	6	1	14		
Los Angeles County	14	8	1		3	1
Orange County		3			3	
Riverside County		1				
Totals	160	72	6	63	25	1
DIST. 2—Bardsdale	1	1		1		
Oxnard	1				1	
Piru		1				
Rincon	2			3		
Santa Paula			1	1		
South Mountain	1	1	1			
Ventura	3	11		1	1	
Ventura County	1					
Totals	9	14	2	6	2	
DIST. 3—Arroyo Grande	1				1	
Cat Canyon	1	1				
Goleta		1				
Morales	4	7				
Russell Ranch		1	1	2	3	
San Ardo		1				
South Cuyama	9	10	1	1		
Contra Costa County		1			2	
San Benito County		2				
San Luis Obispo County		2			3	
San Mateo County		1				
Santa Barbara County		2			2	
Totals	15	29	2	3	11	
DIST. 4—Antelope Hills		1				
Canfield Ranch	2					
Cymric	3				1	
Edison	9	5		1	1	
Elk Hills	15	9		2	3	
Fruitvale	8	1		8		
Kern Bluff	2				1	
Kern River		1				
McDonald Anticline		1				
McKittrick	3	1				
Midway	8	4		1	2	
Mountain View	11	2	1	4	1	
North Coles Levee				1		
Paloma	3					
Poso Creek	1					
South Belridge	7	10		3	1	
Strand				1		
Sunset	1			1		

MONTH OF JUNE, 1950—Continued

Field or county[1]	Tests	Proposals				
		New wells		Deepen or redrill	Abandon	
		Drill	Supplementary		First	Supplementary
DIST. 4—Continued						
Tejon	1			2		
Tejon Hills	5	4		1		
Ten Section		1				
Wheeler Ridge		1				
Kern County	4	11		1	8	
Tulare County					1	
Totals	83	52	1	26	19	
DIST. 5—Coalinga	4	1		1	4	
East Coalinga Extension	2					
Guijarral Hills	3		1	1		
Jacalitas	1	1				
Kettleman North Dome				4		
Raisin City	1	1		1	1	
Rio Vista Gas	2					
Colusa County					1	
Fresno County		2			2	
Humboldt County		1				
Kings County		1			2	
Merced County					1	
Sacramento County	1	1				
Stanislaus County					1	
Tehama County		1				
Yolo County		1				
Totals	14	10	1	7	12	
Grand totals	281	177	12	105	69	1

[1] Wells not in proved oil fields are designated by county only.

DETACH POST CARD AND MAIL